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NOTICES ON KAREN NEE, THE COUNTRY OF THE KAYA OR
RED KARENS.

By
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GEOGRAPHICAL POSITION OF KAREN NEE.

The country inhabited by the race of Red Karens lies between the parallels of 18° to 20° N. Lat. and 97° to 99° E. Long. On its southern extremity, it is bounded by a mountain stream called the "Khai Ma Hpee" or "Tin producing",—which drains a portion of the mountain region on its S. Western side, and flows into the Salween River. To the north, a small stream—the "Nan-pai"—an affluent of the "Een-lay-Yua" river, forms the boundary between it and "Levai-loong"—a mountainous tract subject to the authority of the Mobyay (Shan) chief. This stream however joins the "Een-lay-Yua" river at a point central on the northern frontier, from which the line eastward diverges considerably farther northward as far as the "Baleng" range of mountains, enclosing the "Pwon" river and its sources, and extending to the Salween River. This latter stream on the east and the upper course of the "Poung Loung-ngay" on the west, form well

defined lines of demarcation on both sides. From the southern extremity, the Salween River trends in a N. Easterly direction, giving an irregular and wide-extended base to a cone-like shape for the whole territory.

TOPOGRAPHICAL DESCRIPTION.

Descending upon the central portion of "Karen Nee" from the western ranges, at a height of 6200 ft. the lower formations present the appearance of a country of widely arched undulations of low altitude, enclosed between high ranges of mountains on its southern and eastern faces, and extending in unbroken wave-like lines to the horizon northward; while the prospect to the west is closed by the subordinate ranges of Mountain Limestone, fractured on the sides and ridges into fantastic shapes of high-walled and battlemented forts, with torrents and gigantic buttresses, in a state of ruin. Reaching the springing of the undulations, it is then ascertained that they have a higher altitude than was supposed when seen from above, and that the converging lines form gently sloping valleys of a quarter to one and a half miles in breadth;—these rounded hills occupy (in the southern portion) about $\frac{1}{3}$ of the whole latitudinal surface of the country, and incline with graceful curvature to the northward, until merged in a vast plain which extends from that point far into the Shan States.

With my Camp pitched on the top of one of the hills of medium height, I found the altitude by the boiling point to be 3,315 *feet*, and with this datum the range of elevation of the undulating surface may be stated at from 3000 to 3650 *ft.* above the sea-level—that of the plains on an average I found to be 2850 *feet*. Whether this space be a raised "plateau" with declivities to the east or northward I had no opportunity of ascertaining beyond the defective information of the natives; and by those who had traversed the country in every direction I was told that there is no perceptible descent from the level of the plain in either direction. Certain it is, that from an elevation of 1200 feet above the plains, from which a range of vision with the glass was obtained of from 20 to 25 mles, no descending line could be traced, and I am therefore disposed to conclude that from the point of the great rapids on the Salween River, a gradual rise of the surface occurs, which continues with varying lines of altitude from 2500 to 4000 *feet* through the Shan States to the N. Eastern spurs of the Himalaya.

Some idea of the picturesque beauty of the scenery may be formed from the fact that neither on the more distant ranges of hill, nor those of the lower, is any continuous forest jungle seen at all, with the exception of lines in the steep gorges of the water course having given place to a careful cultivation of the soil for upland cereals to meet the wants of man, nor is there an absence

of vegetation of larger growth to vary the landscape. Then where the numerous villages mark the homes of the natives, the graceful foliage of the gigantic bamboo associated with the banyan and cotton tree afford a rich variety of shade in relief on the bright red color of the soil—the more distant chain of mountains to the eastward of the Salween River with their tops enveloped in clouds, the nearer limestone hills seen through a dim blue haze in rugged outline, the vast plain beneath shining with all the golden hues of autumn, and the park-like appearance of numerous enclosures, with herds of cattle grazing near the water-courses, all combine to form a picture of surpassing magnificence and home-like, tranquil beauty.

In the hilly or upper central portion of the country no running streams exist of any consequence, the wants of the natives being supplied by small runlets formed in the steepest declivities of the undulations.

GEOLOGICAL AND MINERALOGICAL CHARACTER.

Tracing the series of formations from the anti-clinal axis of upheavement, at a distance of 18 miles to the westward, where, at a height of 7250 feet, the Schists and Gneiss of the Silurian system appear in a highly disrupted state, the Limestone of this locality would agree with that of the "Devonian" alternating with the Sandstones of that system. It differs from the usual character of the Mountain Limestone both in color and density, but, like it, has a tendency to form circular cells on the surface in the process of "weathering". In outward appearance it has an uniform grey color, is extremely hard, compact, and fractures in splintery fragments:—internally, its color varies from a dullish slaty and drab, to a flesh tint, profusely intersected by thin veins of white and red:—and occasionally thick veins of the crystallised carbonate, white and slightly translucent, permeate the mass. It is in general character a marble of great density, adapted for all useful and ornamental purposes.

The ranges of this rock have a very uniform parallel direction, E. S. E. & W. N. W., and occur over a longitudinal space of about 35 miles unmixed with other formations above the surface; but in the fissures, and spread at the bottom levels of the undulating hills, fragments of a hard quartzose Sandstone are found, highly impregnated with oxide of Iron to an extent that constitutes it an ore of that metal.

Enclosed between piles of Limestone ranges whose rugged lineaments and mural bases afford a striking contrast to the central or undulating portion of the country, the difference in this respect might suggest a difference in the nature of the formation; such however is not the case, as is seen on the surface of the latter where blocks of all sizes of the same rock crop out, caused by the

wastage of the surface during many generations of cultivation. It is therefore evident that the action of upheavement which formed the ranges as they now exist, was less violent in the central space, leaving a swelling ocean-wave-like form of the surface, instead of the more disrupted disturbance of the former masses.

Of its mineral character I am not in a position to speak so confidently. Knowledge of this nature requires time and research to attain, when unaided by an acquaintance with such deposits on the part of the natives themselves. At the southern extremity of the country, however, the Tin deposits of the "Khai ma H' pu" stream have been long known and worked by the resident Karens; there the "Granite" in which the Tin lodes occur displaces the Limestone, and from the same locality I obtained specimens of a green carbonate ore of Copper, giving evidence of the presence of that metal also. These, with the Iron ore previously noticed, are the only varieties of ores that have as yet come under my notice.

AREA, DIVISION AND POPULATION.

In the computation of the area of a country so little known as this of Karen Nee, considerable dependence must necessarily be placed in the information obtained from the natives, whose estimate of distances is various as it is rude:—thus some compute by the number of pipes of tobacco consumed, others by the number of halts for rest during the journey, actual measurement they know not, hence all such data must be defective; with every care however to ensure some degree of correctness I have come to the conclusion that 80' of Lat. by 95' of Long., or a superficies of 7,200 Sq. Miles, will represent, as an approximate item, the area of the country occupied by the Red Karen race.

As at present obtains, the country is divided into two portions, or the East and West Karens; the former under three chiefs occupying $\frac{2}{3}$ ths, and the latter belonging to the two Chiefs Kyay h'pos about $\frac{1}{3}$ th of the whole. The line of demarcation however is very irregularly defined, and affords a prolific source of disputes and contentions between the respective chiefs and their partisans. In the eastern portion of the country 92 villages acknowledge the two Kyay h'pos as their chiefs, these villages contain 7360 houses, and giving 5 souls to a family, which I am assured by the head men is below the average, we have a population for the western portion of 36,800 souls. On the eastern side the villages are much larger, more continuous and more densely populated than those on the west, and from Kyau Pee Tee's own statement I have it, that his portion in which reside the chiefs, Koon, Tso Pya Ten and Pa Ban gully contains upwards of 1,200 villages, or 36,000 houses which at the former average of 5 souls to a family give 180,000 making a total population for the whole country of

216,800 of which $\frac{1}{3}$ d are slaves, or about 28 souls to the sq. mile, and from the evidences presented on the face of the country, in the numerous sites of villages and the all prevailing cultivation which covers the surface, I am disposed to regard the amount shewn as representing the maximum of the population,—the proportion belonging to or rather claimed by the Chiefs Kyay h'pos being about $\frac{1}{4}$ th of the whole.

CLIMATE.

As my experience of the climate was confined to so short a period as the better part of a month, I am only enabled to speak from actual observation of the number of days of residence, and that during the season of the year when the temperature is at the lowest range—thus the daily indications of the thermometer give a range for the higher elevations of 55° to 70° , and for that of the Plain at "Noung Bala" 48° to 76° the lower temperature of the latter being caused by the vicinity of water, a greater degree of moisture in the atmosphere and consequent excess of daily evaporation. The mean average for the uplands may however be placed at 62° and that of the plain at 66° for the month. During two days of cloudy weather attended with rain, the range from 52° did not reach 60° and the feeling of chilliness was intense.

As regards the remaining portion of the year I note, from the information of the agent, that although the temperature in the morning and evening is not so cold as at present, it is sufficiently so to render the use of a blanket necessary and especially so during the rains; also that there is no portion of the year when the heat is oppressive similar to that felt in 'Toungoo or the large river valleys. As regards the rains, they appear to set in at irregular periods, but are generally established by the middle of June and continue till the end of October:—the showers are described as being more partial and less copious than those of the lower regions of the "Sitang", which is doubtless owing, in a great measure, to the position of the country sheltered by high ranges of mountains on its west side, on which the surcharged clouds of the S. W. monsoon lose the excess of moisture in their passage across the tropics.

Of the exceeding salubrity of the climate there can be no doubt; where neither fogs nor miasmatic vapours prevail, and no dense jungle exists to taint the pure air with its noxious exhalations from the decomposition of its humus, the conclusion is easily made without the corroborative testimony of statistical returns. I shall therefore merely repeat the words of the "Shan Poongye", for several years a resident at the chief's village, to the effect that, with the exception of those who die from the effects of the small pox and measles, the adults die generally from old age;—that fevers and other diseases of the plains are rare, and when occurring are

to be attributed to the excessive indulgence in the universal fermented liquor—"Roung Yai"; that children are reared with little care and the deaths of infants very few; and finally, as stated by the old chief himself who declares his age to be upwards of ninety, that that dreadful scourge the *Cholera* has never visited this highly favoured region.

THE FAUNA AND FLORA.

As these remarks are not intended as a scientific exposition of the natural history of the country, I have merely to state briefly such general characters of the animal and vegetable life which came under my observation, as would indicate a marked difference of climate from that of the lower region. And, first, of *Domestic Animals* adapted to the wants of man. *Black Cattle* abound in every village; no care appears to be taken of them: the females and young are permitted to roam at large over the vast plains and upland cultivations when in fallow; the males are generally castrated soon after birth, and at the proper age are trained to the use of the pack saddle and plough, so that each householder possesses from 1 to 3 or more bullocks with which he carries or drags all the materials for his household and other requirements. *Buffaloes* of a large size would appear to be numerous in the northern portion of the country, to which, from its level surface, their use is more adapted, and of both *Black Cattle* and *Buffaloes* numerous herds, chiefly of the former, are seen, to the number of several thousand heads, grazing in all directions, and all in capital condition.

The next most serviceable animal to the Red Karen is the *Pony*. In common with the herds of cattle they are allowed to breed and roam at large until of a sufficient age to be broken to the saddle; no care whatever appears to be taken of them and they are consequently ragged and inferior looking beasts, but hardy to a degree; and no man of any consequence is without one upon which at an ambling pace, with numerous small bells suspended in the throat-strap of the bridle and armed with spear or matchlock, he performs a journey of 15 or 20 miles with celerity and ease.

Pigs and *Goats* are also numerous, the former of the Chinese breed, with low flanks and short stout limbs—they are also permitted to seek their food in the open and return in the evening to a peculiar call of the villagers. The "*Goats*"* are exceedingly fine animals, and appear to derive a most nourishing food from the short sweet grass of the "downs", certainly those which I purchased for food were in appearance and flavour equal to gram

* The wild goat is found in the hilly tracts.

fed mutton. The common fowl is universally reared and is consequently plentiful, but it would appear that the purpose to which it is applied is not so much an item of food as that of providing a means of augury from the bones—a process hereafter described—and therefore forming a portion of the superstitious observances of their spirit worship; on which *Pigs*, *Fowls* and *Dogs* form the usual sacrifices and are eaten by the worshippers.

Of wild carnivorous animals, the Leopard of the larger kind (which sometimes attacks the cattle,) and the smaller animals of that class, are the only ones found in the country, and these, owing, I presume, to the absence of jungle, of which the whole surface has been long since denuded, are not common.

The "Gye" or "Muntjak" and the "Tsit" "*Cervus*—" are occasionally met with on the skirts of the low hills, but the absence of cover is against their becoming more abundant in the central country. Of *Game*, I am enabled to state from my own observation that a small white bellied "hare"—the spotted and the brown backed "pheasant" and the red-legged "partridge" are common, the hare and the partridge more especially so; the call of the latter being heard in all directions in the morning and evening, and rising in short flights from the stubble on being disturbed.

When at "Noung Belai" close to a large sheet of water I observed of water fowl the "Ash Coloured Heron" the "Plumed Stork" the "Egret"—the small grey and the large "spotted Duck and a variety of the "Wader" class which I had not previously seen; and on crossing the plain to "Ngwai Toung" the "Golden Plover" and the Jack and painted "Snipes" spring to the passage of the Elephants in the wet soil near the water courses.

Of those types of vegetation which were new to me I made a small collection chiefly of shrubs and creepers, amongst which will be found specimens of the wild "Raspberry" and "Strawberry" two kinds of "Fir" (Pines) and plants of creeping vines the flower of which possesses a delicate and pleasant fragrance, and would I think be considered a great acquisition by the floricultural botanist.

Of ferns, orchids and mosses the country is comparatively bare, the atmosphere not being sufficiently humid to encourage their growth. I was only enabled to collect one specimen of the former in appearance and habit like the field fern of Europe; and of "Orchids" the few collected differ considerably in character from those of the lower jungles.

HISTORY OF THE RACE OF KAYA OR RED KARENS

An insuperable difficulty presents itself in tracing with any degree of correctness the origin of a barbarous race of people who possess no written character, and whose history is clothed in the

obscurity of legendary traditions handed down to successive generations by oral agency alone, in which much of the fabulous becomes mixed with certain transactions of a nature to note indefinitely the era of their occurrence, but affording no positive source from whence to divine anything approaching correct data. It is thus with the race of the "Kaya" so called by themselves in their own language, that of "Karen Nee" or "Red Karens" been given to them by the Burmese and surrounding peoples, from the predominating color of their costume—the short drawers and turban being generally of that color; which distinguishes them from the other tribes of "Karens," whose attire consists of a white tunic, and are on that account termed "Karen Pyee" or white "Karens."

The source of the present information is the old chief "Kyay h'po gye" whose extreme age and impaired faculties renders it necessary to curtail and make much allowance for the discursive process of the recital, and the improbable and supernatural events which garnished it.

As far back as tradition reaches it would appear that the original country of the Kaya was Pagan on the Irrawaddy, from whence together with a number of Kallahs (of what race is not stated) and Taroks or Chinese, they were driven by the Burmese—of the probable date of this occurrence no information could be obtained. From Pagan they proceeded to the mountains of Nathtsik in a S. W. direction from Amerapura, where they remained for only a few months, or a sufficient time to allow them to plant and reap the crop. From this place they were again driven by the Burmese when they separated, the Chinese proceeding to their own country, the Kallahs in a northward direction, and the Kayas or red Karens to hyoung Yuay in the Shan territory west of the Salween, where they remained only for a short period and were again attacked and driven forth by the Burmese to the western ranges of the Mobyay province; from which locality they were expelled by their old enemies the Burmese after a residence of a few years. At this period the race had become numerous and had been augmented by the addition of numbers of Karens from the western ranges. Being again compelled to seek a place of refuge farther to the south, they attacked and drove out the Shans who occupied the northern portion of the country (Karen Nee), and established themselves at a place called Ta hoorn to the eastward of Nyoung Belai, from which point as they increased in number, the higher lands of Kyay-la-tset, the residence of the present chief Kyay h'po gye, were added to there territory.

From the period of the arrival of the race at Ta-hoorn to the present time, ten generation or about 400 years have passed away,

and from that of the establishment of the village of Kay-lat-set eight generations ; and this bears a tincture of correctness without, from the circumstance that the present chief traces his descent and enumerates his ancestors in a direct line through eight successive generations from the founder of the village Tso-Sha.

With regard to the history of the former chief Pa Ban Meng gyee—a name of local import merely—who died at an extreme old age a few years ago, the chief Kyay-h'po-gyee gave the following information.

Pa Bun or Mounng H'pon was a Burman native of the town of Mo-tso-bo. He was a scion of the old Burman dynasty previous to Alompra during whose reign he resided with the Eing-Shay Meng, or heir apparent, at that place, and in consequence of having seduced the daughter of that prince and made her his wife against the wish of the father, he with his wife were compelled to fly from the vicinity of royalty to Toungoo, where, being pursued by the agents of the Eing Shay Meng, he took refuge with the White Karens in the mountains east of that place. At this period the great-grand-father of Kyay-h'po-gyee, by name Lo Lya, was chief of the Red Karens, and on being made acquainted with the circumstances attending the presence of Mounng H'pon amongst the Karens, sent an invitation offering him an asylum in Karen-Nee. The Karens however objected to his leaving them, and he was at last compelled to make his escape furtively into Karen-Nee assisted by emissaries sent by Lo Lya for that purpose. On his arrival in the country he was given a place of residence at Lau kee koo, a large village about 3 miles to the north of Kyay-h'po-gyee's locality, where the house in which he lived still remains, being kept in repair, occasionally white washed, and used as a spirit or Nat house. After a few seasons, on his expressing a wish to have a place assigned him upon which to locate his family and followers, Lo Lya gave him a part of the country to the Eastward at a place called Mein Nway where he resided until his death. It would appear that numbers of the Red Karens looked upon Mounng H'pon as a being of superior race to themselves from his connection with royalty, and flocked to his vicinity, regarding him as their chief, until the number of his adherents greatly exceeded that of any other native chief of the country—hence his celebrity as Pa Ban meng gyee the chief of Karen-Nee; from whom the present chiefs of the eastern portion of the country claim descent and affinity either as direct descendants, or by marriage with members of his family. Kyay-h'po Ngay, the chief of Nounng Belai, is a descendant of a relative of Lo Lya the great grand-father of Kyay-h'po-gyee, consequently a connexion of the latter, but in what degree of consanguinity could not be explained.

Such is the crude outline of the history of the Kaya or Red Karens. Driven originally from their ancient homes by a race of greater intelligence and energy, they found a resting place in a country singularly adapted to the maintenance and increase of their kind, both as regards climate and fertility of the soil; and being defended by natural barriers on three sides of their country they have been permitted to remain comparatively unmolested by the Burmese, Shans and Siamese, who are but too well acquainted with the natural advantages of their position. Hence, when a Burmese force from Toungoo invaded the western portion of the country about ten years since, the inhabitants, unable to cope with them from want of fire-arms, deserted their villages and fled to the mountain fastnesses of the west, where the Burmese dare not follow them, and after keeping possession of the central country for a period of three years, they were at length compelled to retreat to the northward with a loss of upwards of a thousand men destroyed in the constant harassing guerilla warfare of the Red Karens; in whose hands they left the only two pieces of ordnance that formed the strength of their artillery.

That the race has occupied the country during many successive generations is sufficiently manifest on the face of the country. Not a vestige of primeval forest exists on its surface and the soil bears evidence of a considerable wastage in the rocks of the sub-stratum which, originally covered, have been bared by the process of its cultivation. And that they are a distinct people from the surrounding nations of Burmese, Shans, Siamese, Chinese and Karen tribes is equally apparent in their physical conformation, their habits and customs, and more especially in the absence of all analogy with the languages of these people. The only approach to such analogy, to a degree admitting of a question of affinity, appears to exist in the language of the Toung-thoos who style themselves Pa-o, with which that of the Kayas agrees in names of ordinary import and the numerals, with the difference only of a broader dialect.

PHYSICAL CHARACTERISTICS OF THE KAYAS.

Surrounded as the Kayas are by tribes and races of peoples whose physiognomical characters mark them as belonging to the pure Mongolian type; it is somewhat remarkable that they should preserve a distinctive difference in mould of form and feature, and particularly in their carriage, which, to an eye accustomed to the unvarying high cheek bones, square lower jaw and low head of the Bwai's (wild Karens) and the elongated features of the Shans, their more angular noses and oblique eyes, renders the disparity still more striking*. The size of the Kayas as a

* In size—the skull of the Kayas is smaller, as a general rule, than

general standard may be considered as exceeding that of the Karens, the ordinary height being assumed at 5 feet 7 inches, but many exceed that, though rarely reaching the height of 6 feet. Where in the nomade races of the Karens the body is found square, low, and thick set, with the pelvis broad and expanded, these features in the Kayas are modified to a more upright frame, narrow and sloping shoulders, longer neck and body, with limbs more in proportion to the length of the vertebral column, giving to the *toute ensemble* a more active and pleasing outline than that of the sturdy mountain tribes. The same difference is observable in the lower extremities of the Kayas, the thigh and leg bones have a symmetry of proportion and the calf of the leg is less muscular than that of the Karens;—this latter remark however applies to the males exclusively, as in the same portion of the female economy the muscles of the leg are developed to an extent rarely seen even with the short and thick limbed females of the mountain tribes. This peculiarity in the female Kaya may be attributed, no doubt, to the custom of wearing masses of beads round the leg immediately below the knee as elsewhere described, and as they advance in age to the habit of carrying the children and heavy loads on their backs by a sling passing round the forehead and over the shoulders. The continuous pressure upon the muscles of the leg causes the large development in question. Instances, of young women not more than 18 years of age have come under my notice when, from the effect of the pressure of beads alone (of from 4 to 5 lbs. on each limb), the calf has exhibited a rotundity out of all proportion with the rest of the body and which would have extorted the envy of the flower of the London Jeameses. The difference in stature between the male and female is also less wide than with other tribes of Karens; the height in general of the female approaches that of the males, and it is not of rare occurrence to meet with women surpassing by a large proportion the bulk of their lords, both as regards height and breadth of frame. The eyes are usually deep set, eye-brows straight and joining at the nose, and the latter broad at the base with, in many instances, slight curvature; rounded tip and slightly compressed nostrils; and the facial angle larger than either in Karens, Shans or Chinese of the N. W. frontier of China. The form of feature generally of the Kayas is one possessing a certain degree of intelligence, a livelier expression, and, in the female, an approach in youth to what in our philosophy we deem good looking; but, with the universal antipathy to ablu-tion, the features of both sexes become so foul as to hide the natural

that of the Karens and Shans—in form it is intermediate between the two:—the anterior part is small and less developed than that of the Karen, and the posterior part so uniform in its outline as to present a semi-spherical appearance when viewed from the front.

expression of a clean cuticle, however fair the proportions may be beneath. As already remarked the Kayas or Red Karens are so named from the costume, (the head dress and short drawers), being invariably of that color; that of the skin, however, would bear out a distinction of race from the surrounding tribes. With both the Karens (Bwois—Phgohs—Lethtas), Paloungs, and Shans of both the Yo-mah and Poung-loung ranges the color of the skin is dingy white of varying shades, but with the Karen Nis (Kayas), in common with a mountain tribe called Ta-Shoos, the prevailing color approaches a copper of medium shade and brightness, and this is preserved in the race from the circumstance of inclusive generation, the Kayas rarely if ever taking wives from other tribes.

HOUSES &c.

Unlike the mountain tribes of Karens who associate in communities within one building for mutual protection—the Kayas have their villages on hills surrounded by their cultivations, the number of houses being proportioned to the cultivable land in its vicinity:—and each family possesses its own house, a long structure of a single apartment, formed entirely of the stems of the gigantic bamboo and covered with grass, in which all the members of a family vegetate in common with the fowls and dogs,—the under part of the houses being usually raised some 6 to 7 feet from the ground, and occupied by the pigs, ponies and bullocks. From 50 to 200 houses of this description form a village which is rudely enclosed with the prickly bamboo to prevent surprise when attacked by their enemies of the Eastern Side.

GOVERNMENT.

The term is too comprehensive when applied to the regulation of the social relations of races who possess neither law nor dominant authority. Such as the state of the race of the Kaya; the only semblance of authority which exists amongst them is that of the chief or head of the tribe or community, who is regarded simply as the Patriarch, but whose power for good or evil is nominal. In common with the other members of the community he possesses lands tilled either by his own labor or that of his slaves and others dependant upon him, and in his immediate vicinity is appealed to for the settlement of disputes, and arrangement of fines as compensation for damage or loss of life, which occasionally occur in their ceremonies of spirit worship and other festivals, where an unrestrained licence prevails: but in general each village chief exercises the same functions assisted by elders, and their award is generally assented to by both parties.

The Chieftainship is hereditary in the family of the Chief, whose sons partake alike of the dignity of the position. Hence the

numerous individuals *soi disant* Chiefs who preside over small communities throughout the country, whose title is not disputed and who assume a degree of importance in their own circle equal to that of the Patriarch to whom they render neither homage nor tribute. It would therefore appear that the position of a Chief, so called, over a large tract of country embracing a numerous population is the result of a combination of circumstances of anterior occurrence, favorable to that position. The ancestor of several generations past may have been an ordinary member of the tribe possessing more wealth, and consequently greater influence, than his neighbors, which a large family and long life have tended to augment; and, with a succession of such favorable combinations of circumstances, a corresponding degree of importance has accrued to his descendants; the eldest of whom being regarded as the Patriarch or the chief of the tribe, to whom a deference is paid; but, with the exception of free gifts of articles forming the necessities of subsistence, presented on occasions of death and other domestic occurrence, tax of any description is never paid.

That such a state of society should exist in isolated tribes and small communities would occur as being the natural one, but when prevailing in a large body of people who have long lost their nomadic habits, and for many generations past have been settled residents of the soil, in numbers aggregating a population of a considerable province, our surprise is excited that not a single dawning ray of the light of civilization has, as yet, rested upon their degraded condition, although surrounded by nations whose claims in this respect are indisputable; and if it be an axiom that all civil governments are based upon religion, not until their present impure faith has given place to a more enlightened one, will any improvement in their social condition be effected by their own voluntary agency.

As a consequence of the absence of that protection which an organized form of government affords, a general insecurity prevails throughout all classes of the community; which is considerably enhanced by the separation of interests as at present obtains in the East and West divisions of the country under Chiefs inimical to each other:—hence arises, the necessity for the use of weapons by all the male population, no man being ever seen abroad without his matchlock and dagger, or several spears, in his possession as a means of defence or offence, as the opportunity offers. There exists, in fact, no restraint upon the conduct of the individual beyond that of the fear of retaliation, and each head of a family acts impulsively, acknowledging no right of control by any dominant authority.

Offences involving loss of property by theft or otherwise are

expiated by an equivalent payment, failing which the offender is detained in bonds by the owner of the lost property and finally sold into slavery to the Zimmay Shans. Other offences against the person, even to the taking away of life, which they little regard, are commuted by pecuniary fines, as the price of blood. In cases of suspicion of theft, the accuser and accused have recourse to the "water ordeal", in which the expense incurred is considerable and is borne by the loser. Two pits are dug near a running stream and being filled with water the parties to the suit enter, and, at a given signal, immerse themselves, he who remains longest beneath the surface being the winner. Death occasionally occurs in these trials by the water ordeal, the loser of his life being considered the winner of the cause in such cases.

RELIGION.

If a debased superstition which acknowledges the power of the Spirit (demon) influence alone in and over the actions and accidents of life can be termed a religion, then do the Kayas possess one,—unlike many tribes of Karens who, apart from the local spirit of their worship, adore an Almighty and mysterious power presiding over the world,—the God of the earth, the air and all subordinate spiritual agency. The Kayas have no such extended belief.

At the entrance of each village under an open space, a small round house of rude construction is seen raised on posts high from the ground, and near it several tall spars to which long white streamers and bamboo basket work ornaments are suspended; these mark the residence of the nat or spirit of the locality, to whom daily offerings of food and the never-failing fermented liquor Koung Yai are made, and who is propitiated on grand occasions with sacrifices of animals. Buffaloes, Bullocks, Pigs, Goats, Fowls and Dogs are offered to the spirit, a small portion of the animal being placed within the shed and the remainder eaten by the worshippers.

Except on occasions when the small-pox or measles prevails in the community and the victims become numerous, the only regular festival or general assembly is an annual one, on the occasion of the removal of the spirit's house and the insignia of its character, on which occasions, I am told, that the people exhibit a recklessness of the lowest degree of barbarous license. The fermented Koung Yai is drunk to excess by individuals of all ages from the infant of four years to the patriarch of eighty. Scenes of the wildest extravagance are enacted, in which the sounding of the gongs and cymbals, the deep booming of the drums, the drunken shrieking of the people, the howling of the dogs and firing of matchlocks, combine to form a picture worthy of Pandemonium itself. Wounds and loss of life are not infrequent on these occasions; and I am

informed by one of the Burman guard of the agent who resides here that, on the last occasion of the fete at a village below my camp, a man and a woman were killed in these orgies.

But, still more absurd and degraded is the practice of Augury by means of fowl's bones, which they regard as the Oracle of the Nat, whence they derive signs of its approval or otherwise. No man enters upon the commonest undertaking of life which involves an uncertainty of result without the preliminary process of consulting the augury of the fowl's bones. He wishes to ascertain whether a piece of fallow-land which he has selected for the season's cultivation will prove productive or sterile. Taking with him a few articles of food, he repairs to the Nat house, where, placing them upon the wooden altar, he invokes the spirit to reply favourably to his inspection of the augury. Having killed a fowl and extracted the leg and wing bones he next examines them minutely, to ascertain the numbers, position and direction of the small apertures upon their surface. Into each hole he inserts a small piece of bamboo to indicate its direction, and should they occur in certain forms considered favourable and in accordance with his own previously conceived result, he is satisfied of the spirit's approbation and his mind is relieved of all care for the future result of his undertaking; but it more frequently occurs that the augury is unpropitious, as the small holes in the bones vary in almost every bird; in such case, a second and a third fowl or more are killed until the desired result is attained. An instance of the extreme absurdity of this practice occurred a few nights ago, when about midnight the sound of two shots fired in the village alarmed my Burman guard who anticipated an attack by some marauders from the eastern side. On the following day it was ascertained that a daughter of the eldest son of the chief was suffering from some disorder of the bowels, which a cunning man had told the father would be removed by firing two shots over her body at midnight, and to ascertain the efficacy of this prescription he had destroyed 13 fowls ere the signs of the augury proved favorable. In marriage as in sickness and in fact in all momentous events of life, this process of augury by fowls bones is indispensable; after inspection the bones are preserved and I am informed that in the chief's house a large bundle of such osseous remnants hangs suspended, comprising the, to him, book of spirit's revelations.

Although woman would appear to be the most valuable of man's possessions with this race, as by her is performed the larger share of out-door labor in addition to that belonging naturally to the sex, the males have but one wife; and neither in the process of betrothment, marriage or birth is any *religious* ceremony observed. A dowry of a certain number of pigs or bullocks, with an occasional dog thrown in as a make weight, is that usually given to the parents

of the woman, and she thenceforth becomes the property of her lord should the augury have declared the match auspicious.

In cases of death and burial also, no religious rites would appear to be observed. The body is conveyed silently to the last resting place of the race—a patch of jungle on the summit of a hill, adjacent to the village, being reserved for this purpose—where it is interred with a portion of the valuables of the family, implements of household use and a supply of food, from time to time renewed: a small miniature house is erected over the grave on which the articles are placed, for the sustenance of the spirit during its mournful watchfulness over the decomposition of the remains; which completed and the body returned to the dust that made it, the spirit departs to the world unknown.

The following absurd legend is attached to the divinity of the fowls bones. In ancient times the Karen races worshipped an Almighty and Supreme Power whose written Law was handed down from generation to generation in the tribes, and from the absence of better material it was recorded on the skin of a buffalo. The chief who had it in keeping, on one occasion, before proceeding to his daily labor, left it in charge of his wife, who, neglectful of her duty, went to sleep. During her slumbers a dog ate up the skin with its holy record so that it was lost, but as the fowls were observed to scratch amongst the excrement of the dog and pick out particles therefrom, they became consequently the depositories of the lost law, and have ever since been consulted through the medium of their bones.

CULTIVATION.

In a country whose superficies does not greatly exceed the demand for the sustenance of its inhabitants, a necessity arises for a careful culture of the soil, and this is eminently the case throughout the whole country of Karen-Nee. The implements of cultivation in general use are a Shan plough of light construction with a broad iron shoe for the share, adapted to one animal either bullock or buffalo:—a spade-hoe with a long handle for breaking up the surface of the uplands and a small hand-hoe in shape and size resembling a ship's scraper, for pulverising clods and extracting weeds.

On the cessation of the periodical rains the fallow-land intended for the succeeding season's crop is broken up either by the plough or the spade hoe according to position. It is then allowed to remain until January or February when it is worked with both the large and small hoes, the clods broken up, and the trash collected, dried and burnt; in this state it remains until the first showers of the season have penetrated it when it is again worked with the plough or hoe previous to planting the grain, which is usually sown broad

cast and the sickly plants weeded out with any weeds that spring during the earlier stage of the crop. Some lands are transplanted, and judging from the grain stalks of the stubble I conclude that such have been highly prolific. The usual return from the uplands is from 15 to 25 fold, which is considered a fair crop. The levels or wet soil of the plain receiving an annual renovation from the deposit of rain and overflowing of the streams, are cropped annually, but those of the uplands are permitted to lie fallow for three or four seasons.

The general character of the soil is that of a rich loam of colors varying from a yellow ochre through the shades of red to a deep chocolate, (but more generally the latter), with the exception of the wet lands of the lower plains, which have the same appearance and tenacity as the alluvium of the lower valleys, and with the greater care bestowed in the tillage appear to be equally fertile.

The Cereals usually planted are the red and white paddy, millet and Kyeik or buck wheat, the two last being used principally in the manufacture of the fermented liquor Koung Yai which usurps the place of water as their beverage. With the preceding the usual variety of esculents of the pumpkin tribe, beans, tobacco, sesame and ground nut for oil, yams and sweet potatoes, the common cotton plant, with small quantities of the dark purple sugarcane, are found in their cultivations, from which every want of life in food, luxuries and clothing, with the exception of salt, is derived, and this, with the universal condiments Nga-pee and salt fish, are obtained freely from the Shan traders who bring it from Shway-fyin and the coast.

NATURAL PRODUCTIONS AND MANUFACTURES.

Tin, *Teak* and *Sticklac* are the articles of commercial value and importance which are exported from Karen-Nee. The first is found as an ore—the peroxide of the metal plentifully distributed throughout the course of the stream which bears its name, Khoi-ma-pyei Khyoung, on the southern extremity of the country. It is rudely worked by the Karens of the locality in which it is found and sold by them to the Shan traders, who use it extensively in their own country and take a portion to the markets of Thway-gyeen and Maulmain. No information can be obtained of the actual quantity produced, neither the Karens who work nor the traders who purchase it paying tax upon it, but the traders estimate their own consumption of the metal at from 10,000 to 12,000 viss yearly, with about half that quantity as an item for that taken coast-wards. This would aggregate an amount of production equal to 17,000 viss, at a purchase value of from 12 to 13,000 Rs.; but this can only be regarded as a rough estimate, probably fifty per cent below the actual amount of production.

Teak is worked by traders from Maulmain on the banks of the

streams which drain the country from the westward. In a similar manner with the previous notice a difficulty of obtaining information of the quantity exported on the spot is experienced. The traders pay a fee to the chief of the Karens of the locality in which it is found for the right of working the timber, and no other charge is incurred. The only approach to an estimate I could obtain was from a Shan engaged in the trade, who said that from 3 to 5000 trees were annually extracted from the streams within the western portion of Karen-Nee.

So far as a cursory observation would admit on the line of march across the upper portions of the streams to the southward, there still exists a very large supply of Teak, but without a proportion of growing Timber to meet future demand when the forests become exhausted; and the circumstance that the traders are now working to the upper course of the streams, affords evidence of the fact that such process of exhaustion is rapidly advancing.

The article of *Stichlax* being propagated in the country affords a perennial source of income to the natives who collect it. The Shan traders take from 2500 to 3000 bullock loads to the coast annually from the western Karens, obtained by barter with the natives for articles of clothing, dhas and implements of cultivation, beads and other ornaments, or by purchase at a rate varying from 8 to 10 Rs. per viss; the load of each bullock averages 30 viss, from which we have 90,000 viss or about 140 tons as the item of annual production of this article, with a relative value received by the native collector of about 8,000 Rs.

The method of propagation is as follows. During the month of September, or at an earlier period after the cessation of the rains, the natives proceed to the ravines and other parts of the high country at the base of the ranges which cannot be cultivated, where the lac insect has covered the smaller branches of the trees with the gum, after collecting which the best specimens of the female insect with a portion of the deposit are selected and attached to the branches of other trees; upon which a fresh deposit is made and cropped in the usual course. It does not appear that the animal affects any particular kind of tree, as the deposit is found on the Peepul, the Szer*, the Pouk †, and the Kyo—the three latter however are more generally selected, and in some instances as much as 80 viss of the gum has been collected from a single tree as the production of the insect for a single season—more generally however from 25 to 30 viss per tree is obtained.

The articles manufactured by the natives of Karen-Nee may be included in the one general term of coarse articles of cotton cloth

* *Zizyphus JEJUBA*.

† *Butea FRONDOSA*.

adapted to clothing, such as scarfs and the ordinary wrappers of dark cloth used by the females for lower clothing and head dress. All articles of finer texture are procured from the Shans, in which may be included the red drawers and Goung Boungs of the national costume, the last article however being invariably Turkey-red cloth of British manufacture. Of *Dyes* and *Drugs* the country would appear to be comparatively bare, the only dye in use being a dirty black with which the women's clothing is discolored. This is procured from the leaves and bark of the Szee-byu which are macerated and boiled, the cloth is steeped in the liquor until the requisite dirty shade is attained, it is then buried in mud for 2 or 4 days the alkali of which acts as a mordant in giving permanency to the color.

Bees Wax—although apparently abundant in the hilly tracts where the steep sides of the limestone with its numerous fissures affords a safe home to the bee, is not collected in any considerable quantity. Small quantities are occasionally obtained from the neighbouring Karens with the honey, which is used as an aid to the fermentation of their Koung Yai by the Kayas. The country throughout appears to be eminently adapted to the habits of the bee in the security for its breeding as before noted, and especially in the numbers of sweet scented flowering plants which every where abound.

REVENUE.

From what has been previously stated it will be seen that neither tax on the land, its produce, capitation, nor in fact levy of any description constituting a revenue for governmental purposes, exists in the country, so that all collections of this nature accrue from the passage of traders through the country to the southward; and this as affects the eastern portion, to which these remarks more particularly refer, has hitherto been very precarious, owing to the frequency of attacks and the arbitrary exactions by each petty chief upon those traders who have essayed the passage; and although an apparent willingness to conform to a more orderly line of conduct has been evinced by those individuals, yet in the absence of all controlling power to serve as a check on their predatory habits, some considerable time must elapse to test the sincerity of those professions ere any large addition to the course of trade through the country is attained.

From the old chief and his sons, I learnt that an amount of about 1000 ticals of silver was annually collected from the traders, and that sum, with presents of articles of trifling value to the extent of 250 ticals formed the whole of the receipts by the chief Kyay-hpo-gyee—that received by the inferior chiefs could not be estimated. The usual charge upon a bullock load of merchandise is from 12 As. to 1 R. but no charge is made upon tra-

ders who come seeking for investments in the country from whom presents are received in lieu of the established rate.

The Burman Superintendent of the eastern division of the country informed me that the trading road through the western portion was known to be very greatly superior to that of his line of route, but that the fears of the Shan traders with Shway-gyeen and Maulmain were too strong to allow of their taking that line, nor would they attempt it without a convoy sent by the chiefs for the purpose of ensuring their security during the passage to the Salween river.

CHARACTER OF THE KAYAS.

It is with diffidence that I offer the few brief remarks which follow on the characteristics of the Kaya race, for the reason, that being first impressions, without the experience of a prolonged acquaintance to establish their correctness, they are prone to error.

As a purely agricultural people without the nomadic habits of their type it would seem strange that some slight degree of civilization inculcating the higher virtues of humanity, has not obtained in their social relations; but I have shewn when noticing their religion, that all the qualities which distinguish man from brute are subject to a crushing and abject superstition, that effectually bars out all the superior conditions accompanying civilization. In their homes a degree of disgusting filth prevails, approaching that of the lowest habits of savage nature. Their houses in fact would appear to be a rendezvous for every living animal they possess; pigs, buffaloes and black cattle all herd promiscuously together under and around, while the poultry and dogs mingle unmolested with the inhabitants within the house. Cleanliness either of person or premises is not regarded, and the stench which arises from the accumulated exuviae of both man and brute is sickening in the extreme. Water rarely touches the surface of their bodies by their own voluntary intention, and as rarely, *in its pure state*, passes into them.

The interchange of mutual acts of kindness would appear to be foreign to their nature;—help in distress is only afforded on terms which involve the loss of liberty on the part of the recipient, should he fail to restore with a heavy interest, the assistance he received; and to this unsocial practice must be attributed the large proportion of slaves which, to the extent of one third, form a part of the population. Suspicion usurps the place of charity, and honesty is a questionable virtue with them,—deceit masked by the most glaring mendacity would appear to be an accomplishment they, in common with most Asiatic races, affect to an eminent degree. Unless under the influence of intoxication, I do not think that they are a passionate race; impulsive without re-

flection they certainly are, but they are, for that reason, less apathetic and more energetic in character than either the Burmese or other Karen tribes.

Such are the traits of character which I have witnessed during my short residence amongst them. One pleasing feature still remains however to be noticed, which is the affection shewn by the husband to his wife and children, but especially to the latter ;—where this exists, there is ample room for hope that the nature of the individual is not so debased as to be beyond the power of amelioration, and that the inculcating the moral principles of civilization will have the same good effect of elevating him in the social scale of the human race which it has done with myriads still more barbarous than the Kayas.

CAPABILITIES OF THE COUNTRY.

From what has been stated in the foregoing remarks when noticing the climate, it will be admitted that the country possesses all the essentials for a Sanatorium so greatly desiderated for the restoration to health of the European members of the force stationed in Burmah, to avoid the necessity for seeking it *outré mer* at the large expense both to the Government and the individual which such a measure entails. With a range of the Thermometer rarely below 50° or above 70° during the coldest portion of the year, and so far as I have been able to ascertain only a slight accession to the temperature during the rainy season,—a clear atmosphere, with sufficient moisture throughout to keep the surface in constant verdure, but not in excess,—the absence of all malaria, and amongst scenery of the most picturesque beauty, in which the wild raspberry and flowering creepers of delicious odour are indigenous to the soil, and the hare, partridge and pheasant rear their young on the hill sides,—the invalid would here find the means of a speedy restoration to health impaired by the hot and humid climate of the Sitang valleys.

But any remarks on this subject must necessarily apply to a remote future, so long as the present means of access to the country are of a nature impracticable, unless under circumstances of toil and exposure of no ordinary kind. The distance by the Perambulator along the road forming my route from Toungoo was barely 85 miles, but on the Western Side of the central ranges, the road having been cut directly across the summits involved variations of altitude of several thousand feet each day, which might have been avoided by scarped lines round the flanks at a lower medium of altitude, and I have little doubt but that a careful survey would result in forming a line of easy gradients on both sides, to afford a means of access to all but wheel-carriages; but the expense involved would necessarily be large.

Next in importance to the restoration of health is that of its preservation and sustenance ; and in this respect I may fearlessly hazard the opinion that the whole country of Karen-Nee, with its plains of 2,500 to 2,800 *feet* and higher uplands of 3,500 to 3,800 *feet* in altitude, possesses advantages in this respect not surpassed by any territory of British India south of the Himalaya. I have elsewhere noticed the fine condition of the Cattle and their abundance ; and, equally with the flocks of goats, sheep would here thrive uncared for, and potatoes, wheat, gram and all the cereals and vegetables of useful economy find in this region a toil and climate extremely favorable to their culture. The country in our occupation would herein prove the *Depôt* from which to draw supplies for the whole military force employed in Pegu.

And in pursuance of that duty inculcated by Divine precept that all the human race may enjoy the blessings of enlightenment of a pure faith, the country of Karen-Nee with its numerous population, at present steeped in the lowest depths of ignorance and barbarous superstition, presents a field of operation which, on the point of humanity alone, claims our warmest sympathies and best agency to improve.

It may not be deemed irrelevant if I here refer to a subject which has of late attracted the attention of both our own and the Dutch Government in India ;—I allude to the propagation of Cinchona in the Island of Java and the proposals for its introduction into India. Referring back to past experiences, the memory brings vividly before me scenes of beauty both in that Island and in the lower plateau of Peru so greatly resembling the higher lands of Karen-Nee both as regards climate and scenery, that I cannot refrain from the expression of my conviction that the Cinchona would in Karen-Nee thrive to perfection and prove ultimately a source of incalculable advantage to our Indian Empire.

The foregoing remarks with reference to the nature of the road to Karen-Nee having been written previous to my return by a road further to the South of the one of my outward route, I am now enabled to amend those remarks by stating, that the former is far more practicable, less difficult, from following the direction of the spurs on the Eastern Side of the central ranges, with a maximum altitude over the passes under 5,000 feet, and possessing other advantages over the latter which render it adapted to become the highway of traffic and communication between Karen-Nee and Toungeo.

TRADE.

The trade of Karen-Nee as at present obtains is confined to the periodical visits of Shans from the northward and traders in Tim-

ber from the Tenassarim Provinces. With the former a barter trade is effected, the interchange of commodities consisting on the part of the Shans of articles of domestic use, such as iron, dhas, pans, spears and plough-shares, with coarse articles of cotton fabric, padded jackets, short drawers, ornamented bags and a large supply of red and white beads which, to the extent of 6 to 8 lbs in weight, forms a portion of the female attire. These articles are exchanged for *Sticklac* which, as shewn in the remarks on the natural productions of the country, is extensively propagated and of large production. On the return of the Shan traders with their investments from the coast of salt, Nga-Pie, dried and salt fish, piece goods, iron, muskets and coarse powder, these articles are disposed of for silver or given as advances for stick lac deliverable on the following season's trading expedition southward.

Any thing approaching a correct estimate of the value of this trade by the Shans it would be impossible to attain, but by taking the number of loaded bullocks as a data which pass through the country (east and west is implied), we shall have a crude estimate of the value involved; thus reports vary from 8 to 10,000 bullocks loads of merchandize as forming the extent of the annual traffic; assuming the lower item to be the average, with a value of 160 Rupees for the load, including import and export, this result shows a total value of 12,80,000 Rs. or nearly 13 Lacs of Rs.

With the Burmese from the sea coast who trade in timber only, merchandize forms no portion of their investments for barter; 3 *ticals per Log* is the usual rate paid to the cutters of the timber and as this is paid upon all logs irrespective of size, the consequence is, the wholesale destruction of the timber within easy access to the water, of which I had ample evidence on my route along the course of the Pong Loun in which stream many thousands of fine young trees green and of too small a size to be of value for conversion into squares were being rotted by the Shans employed by the Burmese traders. With this timber of inferior size however there was much fine wood of valuable proportions, and taking the production of this stream and its numerous feeders as a criterion from which to draw an estimate of the annual value of the timber trade of Karen-Nee, it will not be much below 3 Lacs of Rupees.

The Chinese traders from Yunan who in large numbers visit Zimmay and the Shan states to the eastward of the Salween annually, occasionally made a detour to Karen-Nee in former years, but this, owing to the jealousy of the Yans or Siamese Shans, has been prevented of late years; and the Chinese trade confined exclusively to the states of Zimmay, Labang and Lagong which are tributary to the Siamese Government.

There are many considerations that induce a well grounded

opinion of the eminent capacity of the country of the Red Karens to form an emporium of trade of the first importance. Surrounded on all sides by nations whose commercial enterprise forms the prominent feature of their character, to whom nor mighty ranges of mountains nor rushing streams oppose an insuperable barrier to the progress of trade and its attendant process of civilization; possessing within itself a numerous and comparatively wealthy population eager to a degree to possess the products of our manufacture, and favored by nature in position and climate propitious to the development of many valuable resources which it embraces; under our rule, and guide by our institutions, the period would not be far distant when our influence would be extended through regions hitherto closed against our knowledge and enterprise, and nowhere would it be more appreciated than on the N. Eastern confines of the mighty Chinese Empire.

SLAVERY.

In estimating the amount of population of the country I have stated that about one-third of the inhabitants are Slaves, on which subject I deem it necessary to offer a few remarks in explanation.

The chief cause of this large amount of slavery,—a term by the way only partially expressing the conditions of the subject,—lies in the prevalence of indebtedness throughout the community. Incurred originally by the heads of families to meet some casual expenditure attending their superstitious ceremonies, the debt, increased by an exorbitant interest, has been unliquidated at the period of the death of the borrower, and in such cases, where no effects are available for repayment in accordance with the term of the agreement, one or more members of the family have become bond-slaves, and, unable to meet the payment from their own resources, have become permanently the property of the lender; and although bound to assist in the cultivation of their masters lands, and perform other duties of a domestic nature, they are not debarred from other pursuits from which to derive a means of eventual emancipation; but this is of rare occurrence, and the state of debtor-slavery has thus become an integral portion of their communities.

The other, by far more iniquitous and remorseless state of slavery in its worst features which prevails with this race, has its existence in their kidnapping propensities, no one single individual of whom but is ready on all occasions to avail of the opportunity to seize the person of any of the tribes which occupy the countries in their vicinity;—thus, in many of the villages are seen Shans—Taings of the Karen tribes—Yan-gu-las—Padoungs and Let-htas of the N. W. mountain ranges—all doomed to a hopeless state of slavery, into which, priced like beasts of burden, they are sold to

the Yoons or Zimmay Shans to the number of from 2 to 3000, annually.

An instance of the wholesale seizure of villages of Shans occurred a few days previous to my departure from the country : a large body of Red Karens of the eastern division made a dour upon several villages of Shans situated on the border of Karen-Nee in the district of Een-kay-Yua, and carried off the whole of the population to the number of 360 *souls* who were seen collected at one of the frontier Karen-Nee villages by a Shan trader who passed through the place and gave me the particulars of the outrage. These poor wretches, thus torn from their homes, would be separated from each other as members of a family, would be driven like cattle across the Salween and sold to the Yoons to be by them resold to the Siamese, and eventually end their career the slaves of a nation of slaves ; no worse or more pitiable condition than which can possibly be imagined.

The question to what extent the law of England is in force in the British Settlements in the Straits of Malacca is one not only of practical moment to the inhabitants, but of great theoretical interest, since it involves a consideration of principles of international jurisprudence and ethnic comity that are applicable to all the mixed communities of the European Settlements in the East. For this reason we believe that, in publishing the first judgment in which it has been scientifically and exhaustively treated, we shall at once benefit our local readers and gratify many others in the Archipelago. Dutch and Spanish colonial juriconsults and legislators will be glad to know how difficulties with which they must be familiar, arising out of the conflict of Asiatic laws, usages and creeds with those of Christendom, are met by an English judge, and whether the law of England is possessed of an inherent power of accommodating itself to conditions of society without any parallels in those through which the English nation has passed. In British India also the subject is one of immediate importance, and Sir Benson Maxwell's judgment opportunely supplies an answer to the enquiry how far the law of the dominant race is fitted by its native flexibility to serve as a general *lex loci* for territories occupied by tribes differing not less in religion, laws, and usages than in genealogy.



To the Editor of the Journal of the Indian Archipelago:

My dear Sir,

I have much pleasure in sending you my judgment in *Reg. v. Willans*, in compliance with your request; and in doing so, I beg to thank you for the advantage which I derived from discussing with you some of the questions considered in it. You will see that it runs to great length. This has arisen from my having gone into questions only remotely connected with the point which I was called upon to decide. Having abundant leisure, I took the opportunity, in considering that point, to consider also in some measure, the more general topics, how much of English law is in force here, and how it became our *lex loci*.

The former is a question which must have arisen often in our Court since its first establishment fifty years ago; for, as Blackstone says, (1 Comm. 107), "what portions of English law shall be admitted and what rejected; at what times and under what restrictions, must, in cases of dispute, be decided by the Provincial Judicature." But though it is a question essentially local in character, former Judges have left hardly anything upon it for the guidance of their successors. Upon ordinary points of law, the decisions of the Straits Recorders are obviously not worth reporting;

But upon a question on which the cases decided by the Superior Courts at home cannot give much assistance, since its determination depends in great measure on local circumstances, I think it is to be regretted that the Recorders did not preserve their judgments by publishing them. With the exception of Sir B. Malkin's judgment in Abdullah's case, to which, you will see, I have often had occasion to refer, of the short note of Sir W. Norris' decision on the question of adoption, which you lately published, and of a case decided last year by Sir R. McCausland, but so badly reported in the newspapers as to be of no practical use, I am not acquainted with the printed judgment of any Recorder, in which the question has been touched upon or discussed. It is, indeed, only in Sir B. Malkin's case that it appears to have undergone any thing like discussion. This absence of published judgments, is, as I have just said, to be regretted, because much uncertainty will continue to hang over the administration of justice in the Settlement. Each Recorder must begin *de novo*, and solve for himself, as best he may, the question whether this or that statute is in force here; and the law will fluctuate according as he unconsciously departs from the views of his predecessors, and as his views, again, are, in similar unconsciousness, departed from by his successors.

I am,
My dear Sir,
Very truly yours,
P. BENSON MAXWELL.

PINANG, }
August, 1858. }

REGINA v. WILLANS Esq.

This is a rule calling upon the Police Magistrate of Province Wellesley to shew cause why he should not hear and adjudicate upon a complaint preferred by Mr. Duncan Pasley against one Chivatean, an agricultural labourer in his employment, for having absented himself from his service.

It appears from the affidavit upon which the rule was granted, that Chivatean was sentenced last December, by the former Magistrate of the same place, to two months' hard labour in the House of Correction for a similar offence; that upon the expiration of that term, "he did not and would not return to the said service", and that he was thereupon again apprehended and brought before Mr. Willans, who "refused to adjudicate on the second complaint on the ground that the jurisdiction given to him by the act of Parliament, 4 Geo. 4 c. 34, had been exhausted by the previous conviction and punishment aforesaid, and that he could not punish the said Chivatean for a fresh absenting upon the same con-

tract."

The question raised upon this state of facts is whether the Magistrate's refusal to adjudicate was well founded. Before expressing any opinion upon it, however, it is necessary to determine whether the statute under which the defendant was called upon to act, did give him any jurisdiction, as asserted in the affidavit; that is, in other words, whether it is part of the law of this Settlement. This question has never been decided in the Court, although the Act has been enforced by the Magistrates for many years past; and its decision depends, first, on whether any part of the statute law of England of as recent a date as 1823 is in force here; and if it is, then, secondly, on whether this particular Act is, from its nature, applicable to this country.

How, and to what extent the law of England first became the law of the Indian Presidency towns, and incidentally, of this Settlement, has been the subject of much discussion. Sir B. Malkin laid it down, a quarter of a century ago, that "the introduction of the King's charter into these Settlements had introduced the existing law of England also . . . and had abrogated any law previously existing" (a.) The same doctrine had long before been that of the Indian Supreme Courts with respect to the introduction of English law within their respective jurisdictions; and no stronger proof of the firmness with which it was established here can be cited than the ease in which Sir B. Malkin applied it; for though he expressed a strong doubt as to its soundness in principle, he acted upon it in a case where its effect was to abolish the law of Holland in Malacca and to substitute the law of England in its stead. If this doctrine could now be disturbed, it could not be in this Court, where it must now be treated as beyond the reach of controversy. But as it has been disputed, since Sir B. Malkin's judgment, by the Indian Law Commissioners, and, before them, by Master Stephen in his report in *Freeman v. Fairlie*, and has been sometimes questioned in local discussions in the Settlement (b), it may be as well to consider on what grounds it may justly rest. And as the learned judge who laid it down, stated it to be subject to exceptions which he left undefined, it is advisable, at the same time, to examine whether it is subject to any and what exceptions or qualifications.

Having regard to the circumstances under which this place became a British possession, it may be doubted whether any, or if any, then what body of law ought *de jure* to have been considered at the time of the establishment of the colony, as its *lex loci*, that is, as the territorial law applying to all classes of its inhabitants indiscriminately, without distinction of race, creed or

(a) In the Goods of Abdullah, Morton's Rep. 19.

(b) See *ex. gr.* two articles in the Pinang Gazette of the 8th August and 24th October, 1857.

nationality. The general rule of law determining what is the law of a territory, is, that if the new acquisition be an uninhabited country found out by British subjects and occupied by them, the law of England, so far as it is applicable (*a*), becomes, on the foundation of the Settlement, the law of the land (*b*); but that if it be an inhabited country, obtained by conquest or cession, the law in existence at the time of its acquisition continues in force, until changed by the new sovereign. In the one case, the settlers carry with them to their new homes, their laws, usages and liberties, as their birthright. In the other, the conquered or ceded inhabitants are allowed the analogous, though more precarious privilege of preserving theirs, subject to the will of the conqueror.

This Settlement, however, did not fall exactly under either branch of the above rule. It was neither a colony of British subjects, in the ordinary sense of the expression, nor can it be said to have been an inhabited country when ceded, because four Malay families were found encamped upon it when it was first occupied by us. (*c*) It was a desert island belonging to the Rajah of Queda, and ceded by that prince in 1786 to an English corporate body, which was invested with quasi sovereign powers over territories in its possession, but which it held in trust for the British Crown. Indeed, it was once considered to be not free from doubt whether the sovereignty of the Island was ever ceded (*d*). Mr. Light and the body of Marines who first landed here came, not as British colonisers of a desert island, but as a garrison to take possession of a ceded territory; and assuming that they were strictly British, and that they brought the law of England with them, yet, having regard to the temporary nature and object of their inhabitation here, that law can hardly have been made the *lex loci* by them, but was only the personal law of the garrison and their followers. (*e*) The bulk of the first settlers were Chinese, Malays and Chulias, (*f*) who, obviously, could not establish their respective laws in a British possession as the *lex* or the *leges loci*; and the few Englishmen who established themselves here at the foundation of the Settlement, came, not as men assuming the dominion of a desert land, and settling on it as a matter of right, but as strangers permitted, as a matter of favor, to dwell in a country belonging to

(*a*) 1 Bl. Comm. 107.

(*b*) 2 P. Wms. 75.

(*c*) 5 Journ. Ind. Archipelago. 409.

(*d*) 5 J. Ind. A. 295. See the terms of the cession in 2 J. Ind. A.—New series p. 189.

(*e*) See Lord Ellenborough's judgment in *R. v. Brampton*, 10 East 282, 288.

(*f*) 5 J. Ind. A.

a *quasi* foreign power, with the government of which they had no concern. Mr. Light, the first Superintendent, was instructed to admit into the Island only such colonists as he thought it safe and advisable to admit (a); and it can hardly be contended that the handful of Englishmen who were allowed to establish themselves here under such circumstances, and whose right to reside without the express license of the Company was more than once disputed (b), were such colonists as carry their laws as their birthright to their new homes. The Governor General in Council, it is true, had power to make ordinances and regulations for the government of the place (c), but the power was not exercised in declaring English or other law to be the *lex loci*; and the Crown and Parliament remained equally silent.

Again, Pinang being, at the time when it became a British possession, without inhabitants to claim the right of being governed by any existing laws, and without tribunals to enforce any, it would be difficult to assert that the law of Queda continued to be the territorial law after its cession. Such a doctrine would imply that the continuance of the existing law in a ceded or conquered country was the right, however precarious, of the late sovereign or of the soil itself, rather than the privilege of the inhabitants. But the case of Jamaica, referred to in *Campbell v. Hall* (d), shews that this is not so. Though taken from the Spaniards, Spanish law was not considered in force there after all the Spaniards had left the island. When an inhabited or conquered country is ceded, the new sovereign impliedly undertakes to administer the existing laws among his new subjects, until he changes them; but it does not follow that when the country is a desert, he is to be presumed to undertake that he will enforce the laws of the former sovereign when settlers shall afterwards arrive. Another objection to the continuance of the former law would arise in this case from the nature of the Mahometan law, which is the law of Quedah. Lord Coke laid it down in *Calvin's case* (e) that "if a Christian king should conquer a kingdom of an infidel, and bring them under his subjection, then *ipso facto* the laws of the infidel are abrogated;" and although Lord Mansfield treated this proposition as absurd, the Indian Law Commissioners are well justified, I think, in asserting that "a system of law which, according to its own principles, can only be administered by Mahometan judges and Mahometan arbitrators, upon the testimony of Mahometan witnesses, is not a

(a) 5 Ind. A. J. P. 114.

(b) Minute of Mr. Phillips on the landed tenures of P. W. I. p. 2.

(c) 13 Geo. 3. c. 63 sect. 36.

(d) 1 Cowp 212.

(e) 7 Rep. 17 b.440.

system which can devolve *ipso jure*, and without express acceptance, upon a government and people of a different faith" (a). It seems to me impossible to hold that any Christian country could be presumed to adopt or tolerate such a system as its *lex loci*. In such a case, according to Coke, "until certain laws are established, the king by himself, and such judges as he should appoint, should judge the inhabitants and their causes according to natural equity, in such sort as kings in ancient times did with their kingdoms before any certain Municipal laws were given, as before hath been said" (b); or, more probably, according to the third resolution of the Privy Council (c), English law would at once come into force—the only "natural equity" known to English sovereigns and English judges.

But whatever ought, *de jure*, to have been the law of the land when the colony was founded, it is clear beyond all doubt, that for the first twenty years and upwards of its history, no body of known law was in fact recognised as the law of the place. As to the law of England, so far was it from being regarded as the *lex loci*, that it was hardly recognised even as the personal law of its English inhabitants. This appears very clearly from the early records of the local Government which were published a few years ago in the *Journal of the Indian Archipelago*, under the title of "Notices of Pinang", by a gentleman holding a high office in the Settlement. In the first place, the law of England was not in force for the punishment of crime. Mr. Light was directed in 1788 "to preserve good order in the Settlement as well as he could," not by punishing those who offended against it, according to English or any other known body of law, but, "by confinement or other common punishment" (d); and five years later he is found carrying out his instructions by "whipping and confining to the public works, or sending off the Island" "the thieves, housebreakers and other disorderly persons" who, he complained, then infested the island (e). But this jurisdiction extended only to those inhabitants who were not British subjects. (f) These, it appears, he was ordered, at least in cases of murder, to send to Calcutta for trial before the Supreme Court there (g). But when, in 1793, a man named Sudds was accordingly sent there on a charge of murder, Sir W. Borroughs, the Advocate General, gave it as his opinion that "there was not any law by which the well meant directions given to the Superintendent of Prince of Wales' Island . . . could be supported, as far as they related to the trial or punishment of murder, or any other crimes, at that island;"

(a) Rep. on Petn. of East Indians and Armenians.

(b) *Calvin's Case* 7 Rep. 17 b.

(c) 4 Id. 656.

(c) 2 P. Wms. 75.

(f) Id. 643.

(d) 4 J. Ind. A. 643. 5 J. Ind. A. 294.

(g) 5 J. Ind. A. 2.

(a) for the jurisdiction of the Supreme Court of Calcutta was then confined to Bengal, Behar and Orissa (b). When it was extended by the 39 and 40 George 3, C. 79. §. 20, to all factories and places subject to the Bengal presidency, fresh instructions were sent (25th March, 1800,) to Sir George Leith, the Lieutenant Governor of the island, directing that Europeans guilty of murder or other crimes of enormity should be sent to Fort William (c); but for lesser offences, they appear to have been left in total impunity. As late as 1805 the Governor complains that while provision had been made for the punishment of native criminals, "the more turbulent European remains on the Island free from all restraint, with the power of committing every act of injustice and irregularity towards his neighbour and the most peaceable native, having set at defiance all authority as not legally established on the Island" (d). It may be said that this proves the want of legally constituted Courts rather than the absence of law; but criminal law can hardly be said to exist where there are no tribunals to enforce it. However this may be, what criminal law was in force was not English law. In 1794 a body of regulations were passed by Lord Teignmouth, the Governor General, for preserving the peace of the island (e); and these appear to have continued in force, and indeed to have been the only criminal law in force, down to the time when the first charter was granted.

Next, the law of England was as little recognised in civil matters. Even the general rules of inheritance, which Blackstone considers to be among those portions of English law which are carried to their Settlements by English settlers (f), were wholly disregarded. Mr. Dickens, who was appointed in 1800, partly to act as Judge or assessor to the Lieut. Governor (g) and partly to frame a code of laws for the Settlement (h), urged earnestly, in that year, that the Governor General should enact a regulation upon the subject (i); and even as late as 1823, we find Mr. Phillips, the Governor of the Settlement, mentioning that "the rules which, according to British law, govern the disposition and inheritance of real property have never been applicable to our lands" &c. (j). So, with respect to personal property. In 1804 Mr. Farquhar, the Lieut. Governor, in applying to the Supreme Government for instructions for the distribution of the effects of a person domiciled in the island who had died intestate, stated that there was here "no law nor any fixed custom" ac-

(a) 5 J. Ind. A. 5.

(e) 5 J. Ind. A. 294.

(b) 13 George 3. c. 63. § 14

(f) 1 Comm 107.

(c) 5 J. Ind. A. 158.

(g) 5 J. Ind. A. 167.

(d) 6 J. Ind. A. 93.

(h) 5 J. Ind. A. 195 &c.

(i) Id. 119.

(j) Mr. Phillip's Minute on the landed tenures of P. W. I. p. 8.

cording to which it could be distributed (a). Again, slaves were bought and sold, not only openly, but with the sanction of the local Government, one of whose early cares was to provide registers for those transactions (b); and taxes were imposed by the sole authority of the Governor General in Council, viz. a duty of 2 per cent on all sales of lands, and on the estate and effects of deceased persons (c). Thus, two of the principles of English law were completely disregarded—that which makes a slave free when he touches British soil, or in other words, comes within the jurisdiction of British law, and that which protects the subject from taxation except by his representatives. There were Courts and Judges here before the Charter, but the justice which they administered between man and man within their respective jurisdictions, was not in accordance with the rules of English law. In 1796, justice was administered in petty civil cases among the various native populations, by the head men, or Captains, (as they were called) of their own nation, nominated by the Superintendent, subject to an appeal to an European gentleman who acted as Magistrate, and who himself tried the more important civil cases in the first instance (d). By what law these head men and the European Magistrate were guided, does not expressly appear; but there is no reason to suppose that Malay, Chinese and Chulia Captains were appointed to administer any other law than that with which they might be presumed to be acquainted,—that of their own nation; while it is probable, from the representation of Mr. Dickens, that the Magistrate decided according to what is called natural justice, that is, according to his own notions of what was just. The following passage from Mr. Dickens' report addressed to the Governor General in 1803 shews what was the actual legal condition of the Island at that period. "His Excellency in Council has been heretofore informed that Prince of Wales' Island, prior to its cession in 1785, was under the dominion of a chief who governed arbitrarily, and not by fixed laws. It is now become my painful duty to state that it has so continued to be governed without fixed laws; for upon the hour of my arrival on this island, there were not any civil or criminal laws then in existence, and there are not even now any Municipal, Criminal or Civil laws in force on this island. The law of nature is the only law declaring crimes and respecting property, which, to my knowledge, at this day exists at Prince of Wales' Island; and, as judge, it is the only law which I can apply to the criminal and civil suits brought in judgment before

(a) 5. Ind. Arch. J. 409.

(b) Mr. Phillip's Min. 10. 5 Ind. A. J. 102, 296.

(c) 4 Ind. A. J. 646, 9.

(d) 5 Ind. A. J. 106, 193.

me. But as the law of nature gives me no precepts respecting the right of disposing of property by wills and testaments, the rights of succession and inheritance, and the forms and precautions necessary to be observed in granting probates of wills and letters of administration to intestates' effects, or respecting many other things which are the subject of positive law, I have often been much embarrassed in the execution of my duty as judge in the Court of Justice in which I preside; and many cases there are in which I am utterly unable to exercise jurisdiction." "The cultivation of the island", he adds, "the increase of its commerce and of its population, has made it necessary that fixed laws of property as well as laws declaring what acts are crimes should be promulgated by due authority" (a).

The result; then, to be collected from the early records of the Settlement is, that for the first twenty and odd years of its history, the country had no territorial law. The task of maintaining order among the early colonists was left to the Commandant of the garrison. Crime was repressed and punished by a kind of martial law; that is, by such punishments as a Court Martial pronounced, and the chief local Executive Authority, or the Governor General in Council considered appropriate to the offence. In matters of succession, personal status, contract, and perhaps tort also, as many systems of law were in force as there were nationalities in the Island; and all those laws, again, were probably tempered or modified by that law of nature, or that natural justice which appears to have been the chief guide of the European Magistrate who constituted the Court of appeal. The state of society resembled in this respect that which existed in Europe after the destruction of the Roman Empire, as described by Savigny in the passage quoted by the Indian Law Commissioners: "The spirit of personal laws reigned equally among the individuals of the different Germanic tribes; and the Franks, the Burgundians and the Goths lived on the same soil, each according to their own law. Thus is explained the following passage in a letter from Agobardus to Louis le Débonnaire, 'one frequently sees conversing together five people, of whom no two obey the same laws'". (b). In the midst of all this confusion, this much, and indeed this much only, seems to be clear, that so far from the law of England being in force as the law of the land, its most general and elementary principles were not recognised even by the English portion of the community, or enforced by the existing tribunals.

It must be presumed that the Charter of 1807 was granted with a full knowledge of this state of things, and was intention-

(a) 6 Ind. A. J. 229.

(b) Rep. on petition of East Indians and Armenians, p. 449.

ally adapted to it. No law was introduced *abunde*, contemporaneously with the Charter. It was competent to the Crown to introduce the law of England into this Settlement by such an instrument as a Charter (a); and if that law was not previously in force, and the language of the Charter directed that it should be administered here, it follows that the Charter did introduce the law of England into the Settlement; and the question, to what extent English law became the law of the land is, then, a question of construction rather than of general legal principle, or at least of the one as well as of the other.

Now, the Charter does not declare, *totidem verbis*, that that law shall be the territorial law of the island; but all its leading provisions manifestly require that justice shall be administered according to it, and it alone. As to criminal law, its language is too explicit to admit of doubt. It requires that the Court shall hear and determine indictments and offences, and give judgment thereupon, and award execution thereof, and shall in all respects administer criminal justice in such or the like manner and form, or as nearly as the condition and circumstances of the place and the persons will admit of, as in England (b). And I think it equally plain that English law was intended to be applied in civil cases also. The Charter directs that the Court shall in those cases "give and pass judgment and sentence according to justice and right" (c). The "justice and right" intended are clearly not those abstract notions respecting that vague thing called natural equity, or the law of nature, which the judge, or even the Sovereign may have formed in his own mind, but the justice and right of which the Sovereign is the source or dispenser. The words are obviously used in the same sense as in the well-known chapter of Magna Charta from which they were probably borrowed; "nulli vendemus, nulli negabimus aut differemus iustitiam vel rectum." They are, in jurisprudence, mere synonymes for law, or at least only measurable by it; and a direction in an English Charter to decide according to justice and right, without expressly stating by what body of known law they shall be dispensed, and so to decide in a country which has not already an established body of law, is plainly a direction to decide according to the law of England.

The whole of the Charter appears to me to support this view. It gives the Court the powers of the Superior Courts of law and equity at Westminster, to be exercised as far as circumstances admit, (d) without stating or leaving any room for presuming that

(a) Campbell. v. Hall 1 Cowp. 204.

(b) 1st Charter p. 38.

(c) Id. p. 26.

(d) Id. p. 16.

it was intended that those powers should be exercised otherwise than in the same manner and under the same rules and principles as they are exercised in England. The classification of property into "real and personal," of actions or "pleas," into "real, personal and mixed" (*a*) and the power given to grant probates and letters of administration (*b*) shew that the law of England was alone in contemplation. In the clause which directs that parties interested in administration bonds may sue in the name of the E. I. Company, (*c*) to whom the bonds are executed, it incidentally implies that the rule peculiar to the common law that choses in action are not assignable, is to be in force. The clause which provides for the discharge of prisoners under writs of *habeas corpus* (*d*) refers to a right which no other law gives to the subject, and which was not previously in existence here.

The negative evidence on this subject is at least as strong as the positive. In no part of the Straits' Charters is mention made of any other law than that of England; and this silence is perhaps no where more remarkable than in those passages which purport to adapt the administration of justice by an European Court to the peculiar institutions of Asiatic races. Where ecclesiastical jurisdiction is conferred on the Court (*e*), it is to be exercised only so far as the religions, manners and customs of the inhabitants admit. In the administration of oaths, and of criminal justice, also (*f*), and in framing process for carrying out the orders of the Court (*g*), attention is to be had to the religions, manners and usages of the native inhabitants; but no where is it said that their laws are to be attended to, not even in matters of contract and succession, as in India. Indeed, the provision respecting the framing of process is expressly guarded by the provision that the prescribed adaptation to native opinions and usages shall go only "as far as the same can consist with the due execution of the law and the attainment of substantial justice". (*h*)

(*a*) 1st Charter p. 38.

(*b*) Id. p. 17.

(*c*) Id. p. 20.

(*d*) Id. p. 28.

(*e*) Id. p. 16.

(*f*) Id. p. 38.

(*g*) Id. p. 36.

(*h*) This clause authorises the Court to "frame such process, and to make such rules and orders for the due execution of the same, in all suits . . . as shall be necessary for the due execution of the powers hereby committed thereto, with an especial attention to the different religions, manners and usages of the persons who shall be resident or commorant within its jurisdiction, and accommodating the same to their several reli-

The exclusion of native law is also remarkable in the clause empowering the establishment of small debts' Courts. Although it is provided that the jurisdiction of those Courts may be ethnical instead of local, if thought advisable, nothing is said about applying native law to native cases; but it is merely required that the "administration of justice" shall be adapted, so far as circumstances permit, to "the religions, manners and customs" of the native inhabitants, while the rules of practice are to conform, as nearly as may be, to the rules of English Courts of Request.

gions, manners and usages, and to the circumstances of the country, so far as the same can consist with the due execution of the law and the attainment of substantial justice." In a newspaper report of a case at Singapore, Sir R. McCausland is represented to have cited in support of his decision "those provisions of the Charter which would be otherwise wholly nugatory and inoperative, and which direct that all or any of the powers thereby committed to the Court shall be executed with an especial attention to the different religions &c. and accommodating the same to their several religions" &c. (See *the Straits Times* July 14, 1857). If this report be correct, the Recorder of Singapore would seem to have understood the clause in question as requiring, not that the process of the Court should be framed, but that its powers should be exercised, with attention to native religions, and be accommodated to them. But if this were its true meaning, powers already conferred and limited with all due modifications would be incidentally modified a second time in a clause, the primary object of which, at least, was different; which second modification, again, is immediately afterwards neutralised by the concluding words of the section. It seems to me reasonably plain that the meaning of the clause is, that the process of the Court is to be framed with due attention to native religions and is to be accommodated to them as far as that can be done consistently with an exact enforcement of English law. The Court derives its powers from other parts of the Charter; and the object of this clause is to provide for the framing orders and process necessary to carry into effect the judgments and decrees pronounced under those powers. In doing this, it requires that the prejudices and habits of the various populations shall not be needlessly shocked or disregarded, on the one hand, and yet that the strict and full execution of the law shall not be impaired on the other. It is perhaps redundant to require that process shall only be framed with reference to native religions, but shall also be accommodated to them. But the objection would be equally strong, if the words applied to the powers of the Court. It would be removed, indeed, if the words "with especial attention &c." could be read as applying to the powers, and "accommodating the same" as relating to process; but the word "and" immediately preceding "accommodating" is a grammatical obstacle to such a construction. I did not refer to this case in my judgment, because the reporter appears to me to have so wholly misapprehended the effect of the learned Recorder's judgment in another passage, that I could place no dependence on the fidelity of the report. The question in the cause being whether a devise by a Chinaman of land in this Settlement, upon trust to apply the rents four times a year or oftener, in religious ceremonies for the tes-

It may be said that with respect to at least two classes of Orientals, Mahometans and Hindoos, their laws are part of their religions, and that the Charter includes the former when it mentions the latter. This might be so if the Charter were a Mahometan or Hindoo instrument; but law and religion are too distinct in their nature and to English apprehension, to be treated otherwise than as distinct in the construction of an English Charter.

I am aware that the Charter has been sometimes construed differently. I have heard, on good authority, of a Recorder who gave judgment in opposition to an array of English decisions; holding that the direction to decide according to justice and right emancipated him from all the established principles of law and equity, and referred him to his own discretion and conscience for his sole guidance; not remembering, apparently that his discretion ought to be that of a *vir bonus*, and that the *vir bonus* is he,

Qui consulta patrum, qui leges juraque servat (a)

Sir R. Rieu appears to have considered that the criminal law was the only part of the law of England which was in force here, and that in all civil matters justice was to be administered among the native populations according to their respective laws and customs (b). This view was perhaps founded on the contrast between the express mention of English law in the one case, and the more general "justice and right" in the other. It does not, however, necessarily follow that because the law of England is mentioned *eo nomine* in one passage, it cannot be the law intended by "justice and right" in the other; and any such inference loses its force when other considerations shew that the words have that meaning. If I might conjecture why they were used in preference to "the law of England", I should think it was, possibly, because the latter tator's and his wives' souls, was valid, Sir R. McCausland is reported to have held that "the statute against the accumulation of income" was "wholly English and incapable, without great incongruity of effect, of being transferred, as it stands, into the code of the country inhabited by people of so many different religions", &c. Why the Thelusson Act, which prohibits the accumulation of income for more than twenty one years after death, except for paying debts or portioning children, should be inapplicable to this country is, perhaps, not very obvious, as it rests upon grounds of general policy; but it is clear that Sir R. McCausland cannot have expressed any such opinion, in a case where the devise, so far from directing an accumulation for a period exceeding the limit allowed by the act, directed that the income of the property should be spent as fast and as often as it could well be collected, four times a year or oftener.

(a) See Sir J. Jekyll's judgment in *Cowper v. Cowper* 1 W. Bl. 152.

(b) Evidence before the H. of Lords, referred to in Abdullah's case.

expression is in some measure ambiguous, since in one sense, at all events, it excludes that large branch of the law which is administered in the Court of Chancery. If the view expressed by Sir R. Rice were correct, we should have no territorial law here except in criminal cases; and the Court would be called upon to administer among Her Majesty's subjects in all questions of civil rights and obligations, of personal status and succession, as many different codes of law as there were races or creeds in the island. *Mutatis mutandis*, we should have here the state of things described by Savigny in the passage already quoted. The Europeans, Malays, Hindoos and Chinese would all be living on the same soil, each according to their own law. But, as the Indian law Commissioners observe, a country governed by one of the civilised nations of modern Europe and yet having no *lex loci*, "would be a phenomenon without example in jurisprudence"—(a) except, indeed, in India, where its want has long been felt, especially with reference to the status of Armenians and the half caste or mixed races. However, Sir B. Malkin expressed his entire dissent from this construction of the Charter, observing that the distinction referred to between the civil and criminal law was rather against than in favor of the more extended adoption of the native laws in the former; and his opinion has been adhered to, I believe, by all his successors.

Having referred to those passages of the Charter which relate to the religions and usages of the Oriental races, I must observe that their effect has, more than once, and upon a question of very great importance, been, in my opinion, much misunderstood. Sir B. Malkin, after referring to them all in succession, in Abdullah's case, observed that "in the general impression, the Charter seems to have intended to give a certain degree of protection and indulgence to the various nations resorting here, not very clearly defined, yet perhaps easily enough applied in particular cases, but not, generally, to sanction or recognise their law" (b). To these expressions no other objection can be made than that they are too general to facilitate the practical application of the law of England to the Oriental inhabitants of this place. But in a letter addressed to the Secretary of Government dated July 1837 the same judge went further. "With respect to the law," he says, "whereby rights are constituted and established, I understood the Governor General to consider"—and in a previous passage he had observed that the G. G.'s views did not differ from his own—"that it at present is, and ought in general for the present to continue, the law of England, modified indeed by considerations how far some of its particular provisions and enactments are suitable to the cir-

(a) Petition of East Indians and Armenians, p. 449.

(b) In the Goods of Abdullah. Morton R. 17.

cumstances of the colony, and administered in all cases with a large and liberal regard to the manners, usages and religions of the different nations subject to its operation, but containing no provisions or principles which cannot be based upon that law so modified and construed.....If I am right in these views," he goes on to say, "it follows that all land held by tenures, amounting, by the terms of the grant, to a freehold interest, passes, not to the executor for the benefit of the next of kin, but to the heir at law." This was written before Act 20 of 1837 was passed. "Who this heir may be," he continues, "may occasionally depend on considerations of native usage and religion. These, probably, ought to be more liberally regarded in questions of legitimacy and relationship than any other. It would seem very difficult, for instance, to refuse to treat a Hindoo son by adoption, as a son, and consequently as an heir, in the absence of other sons; or to declare the eldest son of a Mahometan not to be the heir, because his father had two wives at once, and he was the son of the second marriage. But whatever degree of accommodation might, in such cases, be given to the usages of the different classes, the foundation remains the English law of Inheritance" (a). In 1843, Sir W. Norris held that the adopted son, and the natural and adopted daughters of a Chinaman domiciled in Malacca, were entitled to administration, and to the assets of the intestate, to the exclusion of his nephew, resting his decision expressly upon the opinion of Sir B. Malkin as stated in the above passages. "The ground of my decision," he says, "is that I take the same view of the Charter as Sir B. Malkin did, with regard to the law to be administered in these Settlements under that instrument, and which cannot be better expressed than in his own words." After citing the two passages above quoted from the judgment and letter, he adds: "In the 5th paragraph of the report made on the 8th February 1842, by the Law Commissioners, on the Judicial Establishment of the Straits, they express their concurrence in Sir B. Malkin's view of the spirit in which the law of England should be administered in these Settlements; and I have myself adhered in practice to the same principles, frequently directing the two or three widows of a Mahometan intestate to rank as one widow, and their several children as one family, in the distribution of the estate. In one of the petitions in this case, that of Gan Nio, dated the 25th August 1842, the case of Mootoo Vallee is cited to shew that a natural daughter has been considered as legitimate for the purpose of inheritance." (b)

(a) Letter from Sir B. Malkin to the Supreme Government, printed in the Special Report of the Indian Law Commissioners on the abolition of the Recorder's Court the Straits. p. 87. (1843).

(b) See the judgment in the Pinang Gazette 20th February 1858.

I was ignorant of these views when a similar question came before me for decision some months ago, and I then held that the adopted son of a Chinaman domiciled here was not entitled, in that character, to administration, or to a distributive share of his adoptive father's land. On being made acquainted with the case before Sir W. Norris, I anxiously reconsidered my own decision, but found no reason for holding it wrong in principle; and as Sir B. Malkin's opinion, although entitled to the highest respect, was extra judicial, while Sir W. Norris, seemed to have been adopted from his predecessor, rather than to have been the result of any independent consideration of the subject, I thought myself at liberty to abide by my own opinion. I must add that I felt less hesitation in doing so, when I referred to the paragraph of the Indian Law Commissioners' report, cited by Sir W. Norris for I gathered from it that they rather dissented from Sir B. Malkin's views, than concurred with them, if the latter was to be understood, as Sir W. Norris clearly understood him, as holding that the law of England was to be modified *by the Court*, in the extensive manner in which he thought it should be modified in the case of the adopted child. "We concur with the late Sir B. Malkin and the Governor General", the Commissioners say, "in thinking that it (the law of England) ought not to be changed substantially, but modified *by express enactment*, in the spirit in which Sir B. Malkin thought it should be administered, under a large and liberal regard of the different manners, usages and religions of the various nations of which the population is composed" (a); clearly intimating that though they approved of the suggested modifications, they considered that they should be made by the Legislature, and not by the judges. I can see nothing in the Charter to admit of such a departure as that in question from the English rules of inheritance, and nothing in the widest principles of comity recognised by our law to admit of it. In truth, if the several passages referred to by Sir B. Malkin in his judgment, be examined, they will be found, I think, to effect nothing more than would have been implied, if the Charter had merely ordained, in general terms, that justice should be administered according to the law of England, without more. The law of England, wheresoever administered, respects, either *ex comitate*, or *ex debito justitiæ*, the religions and usages of strange sects and nations, to the extent to which the Charter requires that they shall be respected. Thus, if the Charter of 1807 had not expressly provided that witnesses should be sworn "in such manner as the Court should esteem most binding on their consciences," (b) or, in the words of the last Charter, "re-

(a) Special Rep. furnished in 1842 p. 135.

(b) pp. 25, 32, 38.

gard being always had to their religions belief," (a) the law of England would have permitted that our Mahometans, Hindoos, Chinese should be sworn according to the ceremonies of their respective religions (b); and assuredly the law of England would not have compelled those who were appointed to act as Constables, to do anything contrary to their religions customs and manners, even if the Charter had omitted to provide that natives should be compelled to serve in that capacity only so far as their religions customs and manners admitted. (c) So, if the Court does not entertain proceedings *pro salute animæ* against Hindoos, Mahometans and Buddhists, it is not entirely owing to the limits imposed upon its Ecclesiastical jurisdiction by the express terms of the charter; for they would be equally free in England, from any such molestation by the Ecclesiastical Courts. Again, a Mahometan who marries a second wife of his own religion and according to the rites of that religion, is not indictable for bigamy here; but it would be difficult to assert that if he were to contract such a marriage in England, he would be indictable at the Old Baily. The offence was originally of ecclesiastical cognisance only, and would seem to contemplate only the marriages of those people among whom monogamy is an institution.

The only other passage which mentions native religions and customs is that which touches the framing and execution of process. This provision obviously relates merely to questions of procedure and practice; and besides, its effect is expressly limited, as I have already observed, by the provision that native religions and usages are to be respected only so far as the due execution of the law admits. I may add that I am not acquainted with any instances of this adaptation here; and the only cases of it in India that I have heard of are those mentioned by Sir C. Grey in a Minute dated October 2, 1829, (printed in App. V. to Rep. on affairs of East India Company p. 62) viz. the practice, at Madras, of making orders for the maintenance of native widows without suit, and, at Calcutta, of deciding many disputes among natives out of Court by an award.

It does not seem to me, then, that the Charter has in any respect modified the law of England by any exceptional adaptation of it to the religions and usages of the East. With the exception of the perhaps superfluous instructions respecting the framing of process, it might have remained silent on the subject of religion and usage without affecting the administration of justice. In other matters of greater importance, respecting which the Charter makes no provision, native religions and usages are equally respected. Thus,

(a) pp. 23, 26, 30.

(b) *Omichund v. Barker*, Willes 538; 1 Smith's L. C. 195.

(c) 1st ch. p. 41.

if a Mahometan, or Hindoo, or Chinese marriage, celebrated here according to the religious ceremonies of the parties, be valid, it is not because the Charter makes it so—for as I have already observed, it makes no exception in favour of native contracts of any kind—but because the law of England recognises it. The general rule of that law is that the validity of a marriage is to be determined by the law of the place where it is celebrated. "The only principle", says Lord Stowell, "applicable to such a case by the law of England is, that the validity of the marriage rites must be tried by reference to the law of the country where, if they exist at all, they had their origin. Having furnished this principle the law of England withdraws altogether, and leaves the legal question to the exclusive judgment of the law of the place when the marriage was celebrated." (a) But where the law of the place is inapplicable to the parties, by reason of peculiarities of religious opinions and usages, then, from a sort of moral necessity, the validity of the marriage depends on whether it was performed according to the rites of their religion. Referring to the Jews, Lord Stowell says "there is in England a numerous and respectable body distinguished by great singularity of usages, who, though native subjects under the protection of the general law, are in many respects governed by institutions of their own, and particularly in their marriages; for, it being the practice of mankind to consecrate their marriages by religious ceremonies, the differences of religion, in all countries that admit residents professing religions essentially different, unavoidably introduce exceptions, in that matter, to the universality of the rule, which makes mere domicile the constituent of an unlimited subjection to the ordinary law of the country. What is the law of marriage," he adds, "in all foreign establishments settled in countries professing a religion essentially different?... Nobody can suppose that, while the Mogul Empire existed, an Englishman was bound to consult the Koran for the celebration of his marriage. Even where no foreign connexion can be ascribed"—a case similar to that of the Eastern natives of this place—"a respect is shewn to the opinions and practice of a distinct people. The validity of a Greek marriage in the extensive dominions of Turkey, is left to depend, I presume, upon their own canons, without any reference to Mahomedan ceremonies. There is a *jus gentium* upon this matter; a comity which treats with tenderness, or at least with toleration, the opinion and usages of a distinct people in this transaction of marriage" (b). How far the general law should circumscribe its own authority in the matter, it may, as the same judge observes, be difficult to say *a priori*; and unquestionably it is not

(a) Dalrymple and Dalrymple 2 Hagg. Consist. R. 59.

(b) Pertreis v. Tondear 1 Hagg. 136.

easy to extend to Mahometan marriages that principle of comity which the law of England has applied to Jewish marriages, without involving it in a recognition of polygamy, which has always been put by jurists beyond the pale of the comity of Christian Nations. (a) The question has never yet been decided by any Court in England; but Lord Brougham, while declaring in *Warrender v. Warrender* that an English Court would never recognise a plurality of wives, seems to have been of opinion that in dealing with a Turkish marriage "there may be some room for holding that we are to consider the thing to which the parties have bound themselves, according to its legal acceptation in the country where"—or, (in the case of a Mahometan marriage in an English possession,) in the religion in which—"the obligation was contracted" (b). In this place, where the law of England has been for the first time brought to bear upon races among whom polygamy has been established from the remotest antiquity, the Court has had to consider the question, and has always held polygamous marriages valid. Whether the Local Judicature erred, or not, in coming to this decision, I do not stop to consider. It is enough to say that if it decided rightly, it is not because our Charter demands an exceptionally indulgent treatment of the question, but simply because the principle which makes the validity of a marriage to depend upon the religions of the parties, extends to polygamous marriages; while, if the Court has been wrong, it has erred, not in adopting a principle foreign to, and at variance with the law of England, but in stretching, beyond its legitimate limits, a perfectly well established one.

Again, if a Mahometan divorce be valid here—and its validity has never been disputed, I believe—it must be, not because there is anything in the Charter to make it valid, but because the law of England recognises the right of a Mahometan husband to dissolve the marriage contracted by him according to the Mahometan law with a Mahometan wife; upon the same principle that it recognises a Jewish divorce effected according to the custom of the Jews, without reference to the laws of the State where it was pronounced (c). So, in the case put by Sir B. Malkin, of a bequest by a Mahometan of property "to be distributed according to the law of God," I agree, and indeed I decided only a few months ago, that the distribution must be made according to the Koran; not, however, because the Charter requires that the English rules of construction shall be tempered by a liberal regard for the Mahometan faith, but simply because the strict rules of

(a) Story Conf. L. § § 113 a, 114. 2 Kent Comm. 81. 1 Burge, Col. and For Law, 188.

(b) 2 Cl. & F. 531, 2.

(c) *Ganer v. Lady Lanesborough*, Peake 17.

English law require that the intention of a testator shall be followed, and permit that that intention, in such a case as the supposed one, shall be ascertained in the same manner as Lady Hewley's gift to "godly preachers of Christ's holy Gospel", was ascertained to be intended for preachers of the religious party to which she belonged (*a*)—viz: by extrinsic evidence, shewing what was the religion of the testator, and leaving it to the Court to infer from the fact so arrived at, in what sense the words in question were used.

In the same way, if the adopted or natural child of a Chinese or a Hindoo is to be regarded as his heir, it must be, not by virtue of any provision in the Charter, but solely because the law of England recognises him in that character. But if there be any subject on which the Courts of all countries, and especially the Courts of England and America, where the common law prevails, are agreed in disregarding foreign law, and therefore foreign religions and usages also, it is that of heirship or succession to immovable property. Even as to contracts entered into, and instruments executed respecting immovable property within its jurisdiction, it suffers no other law to prevail. It denies, *in limine*, all comity to foreign laws in matters relating to realty, and declares that the law of the *situs* shall exclusively govern in regard to all rights, interests and titles in and to such property (*b*). So far, indeed, has this doctrine been carried, that in *Doe d. Birdwhistle v. Vardill* (*c*), it was decided by the King's Bench, and afterwards by the House of Lords, in accordance with the unanimous opinion of the Judges, that a Scotchman born a bastard, but made, by the subsequent marriage of his parents, legitimate under the law of Scotland, and legitimate, therefore every where, even in England, for every other purpose, could not inherit real estate in England, because our law required that an heir should not only be legitimate, but should be born after the marriage of his mother. "This is a rule," says Alexander C. B., in delivering the opinion of the Judges on the first argument of that case, in 1835, "not of a personal nature, but of that class which, if I may use the expression, is sown in the land, springs out of it, and cannot, according to the law of England, be abrogated or destroyed by any foreign rule or law whatsoever... In selecting the heir for English inheritance, we must inquire only who is that heir by the local law." (*d*) If the law of England, then, refuses the right and character of heir

(*a*) Attorney Genl. *v.* Wilson 9 Cl. and F. 355. and see *The Attorney Genl. v. Pearson* 3 Mer. 400.

(*b*) Story Conf. L. § 463.

(*c*) 5 B. & C. 438; 2 Cl. & F. 571; and 7 Cl. & F. 895.

(*d*) 2. Cl. and F. 577.

to one who, though by the law of his own country legitimate, is not born before the marriage of his mother, how can it give them to one who is not legitimate by any law, or not a son at all of the person whose inheritance he claims? It is obvious that to hold that the natural son of the Hindoo, and the adopted son of the Chinaman, is heir to his natural and adoptive father here, would not be, as in the case of Mahomedan marriage, to give an extreme application to an established principle of law, but to adopt of one at variance with the law.

Both the learned Judges who expressed themselves in favour of recognising an adopted son as heir, appear to have treated the question whether one person was the son of another, as depending upon the same class of considerations as the question whether one person was the wife of another. But the two relations are radically different. The relation of husband and wife is one of contract, and the question whether it exists or not is a question of law. The relation between father and son is founded in nature. The question whether it exists between two persons is a question of fact. The relation between father and legitimate son, who is also his heir, is the same, with this addition, under English law, that the mother was legally married to the father before the child was born. The relation involves a contract, it is true, but it is a contract with a third person, the mother, antecedent to the origin of the relation between father and heir. The question, then, whether that relation subsists is a complex one of fact and law. If the widow, or the two or three widows of a Mahometan, are held entitled in this country to a share of their husband's undisposed estate and effects, it is because the law holds that their marriage, celebrated according to the rites of their religion, is valid, and created the relation of husband and wife. But a stranger decorated with the title of adopted son, or a natural son, whatever may be this rights under Hindoo or Chinese law, cannot succeed to real estate, as heir of his adoptive or natural father in a country governed by English law, simply because not his offspring born after his marriage with the mother.

In this country, it is true, freehold property, as far as regards its transmission on death or intestacy of the owner, is taken to be of the nature of chattels real; but chattels real are for the purposes of the question under consideration, immovable property, (a) and therefore all rights, interests and titles therein or thereto must be equally governed by the law of the land. It may possibly happen that hardship will sometimes be the consequence of thus inflexibly applying our laws to men alien to us, not only in race and religion, but in all their habits and domestic institutions.

(a) Story Conf. L. § § 447, 374.

This, however, is a question for the legislation and not for the Bench. Judges and lawyers may legitimately give it full consideration in applying the known and established principles of law to new states of facts ; but if those principles are to be departed from or "modified," it cannot be done by those whose whole and sole duty is to administer the law as it stands. To leave it in the breast of the judge to relax or supersede general restrictions and rules, whenever he thinks particular cases not within the reason of them, would be, as Fearné says (*a*), a greater mischief in its consequences, than that which is intended to be obviated by it ; for this is in fact making the discretion of the Judge the only law in such cases. I must add, however, that I am unable to see any hardship in adhering, in this country, to the rigid rule of the common law that all questions relating to land are governed solely by the law of the land. Owners of real estate are at liberty to devise it as they please ; and they may therefore direct that it shall devolve (of course within the rule against perpetuity) in the course of succession established by the laws of their own nations or religions. To depart from the rule would it seems to me, lead to great difficulty and confusion ; and I cannot but think that those who would suffer Chinese, or any other law to have a voice in such questions, overlook the inconvenience to which Mr. Justice Story points, "of any nation suffering property locally and permanently situate within its own territory, to be subject to be transferred by any other laws than its own ; and thus introducing into the bosom of its own jurisprudence all the innumerable diversities of foreign laws, to regulate its own titles to such property ; many of which laws can be but imperfectly ascertained and many of which may become matters of subtle controversy." (*b*)

Looking back, then, to the early history of the Settlement on the one hand, and the language of the Charters on the other, I think that Sir B. Malkin had good grounds, inde-

(*a*) Cont. Rem. 535 n.

(*b*) Story Confl. L. § 440, "Very little information," says Mr. Medhurst in a learned article on Marriage, Affinity and Inheritance in China, "has been hitherto collected as to the local usages in different parts of the country, with regard to the rights of succession to property in China ;" (Transactions of the China Branch of the Royal Asiatic Society part IV. page 30). But if the information which he has collected be correct, Sir W. Norris was misled, in the case cited, as to the Chinese law of inheritance ; for the power of adoption appears to be strictly limited to the male relations of the next generation in a regular order of succession. Nothing is said of adopting daughters. Even legitimate daughters are not entitled to any share of their father's real or personal estate, except on failure of the male relatives who are the objects of adoption.

pendently of the uniform course of authority on which he relied, for stating that the King's Charter had introduced English law into the Settlement. It was, no doubt, a startling consequence of this doctrine, that the laws of an old and civilised community were abolished by implication, while those of England were substituted in its stead; but I think that the Recorder would have found it difficult to administer "justice and right" according to the Roman Dutch law, under a Charter which, in the numerous particulars already adverted to, implied that the common law was the only law in force.

The Charter of 1807 having introduced the law of England into this Island, that law, as it existed at that date, would have been the law of this country, if another Charter had not been subsequently issued. This second Charter was granted in 1826, when Singapore and Malacca were first united to Prince of Wales' Island. The question then arises, did it import the later law into this Station? The case of *Rodyk v. Williamson* (a) was a Malacca case, and when Sir B. Malkin decided in it that the law of England had been introduced there by the Charter so as to supersede the law of Holland, he must have held that the law introduced was the law of England as it stood in 1826, since the Charter of that date was the only Charter extending to Malacca. If so, the same law must, upon the same grounds, have been introduced into Singapore by the same instrument. Can it then have had a different effect in Pinang? If it had not extended beyond this place, "the justice and right" according to which it directs the Court to decide, might well have been understood to mean, as was suggested by Sir B. Malkin, "the just and rightful administration of the Law which actually existed" (b) that is, the law of the land as it had been already established and in force for the preceding eighteen or twenty years. But to adopt such a construction here after the decision in *Rodyk Williamson*, would be open to great objection. To treat the charter, *quoad* one station, as merely reorganising a court, while *quoad* the other two it was treated as introducing new law, would be to give to the same instrument different meanings in different localities; a construction which would have neither convenience nor good sense to recommend it. I am therefore of opinion that whatever law the second charter introduced into Malacca, was introduced into every part of the Settlement; and as it has been decided that the law of England, as it stood in 1826 was brought by it into Malacca, I am of opinion that the same law became, by the same means, the law of Pinang.

(a) Cited in the judgment in the goods of Abdullah; Morton R. 19.

(b) Letter to G.G. u ibpsu. p. 87.

Whether a similar construction should be put upon the Charter of 1855, it is not now necessary to consider, because the Act upon which the present motion was founded, was passed before the date of the second Charter. But if that question should ever arise, it will perhaps be material to consider whether the circumstances of the Settlement, or the language of the Charter, require such a construction, or rather do not require that it should be treated, like all the Indian Charters granted subsequently to 1726, merely as an instrument reconstructing the Court. As the new Charter, confirmed in all respects by Parliament, (18 & 19 Vic. c. 93 § 4.) gives the judges of the Court "such jurisdiction and authority" as the Common Law and Equity Judges "have or lawfully exercise" in England, there would seem to be some ground for holding that any powers conferred on the latter by statutes passed at any time before the date of the Charter, would vest in the former also. So, when it directs the Court to "hear", "give judgment and award execution" on "indictments and offences", "and in all respects to administer criminal justice in such or the like manner and form, as nearly as circumstances admit, as the Courts of Oyer and Terminer and Jail Delivery" in England, it might be contended that the English Criminal Law, as it stood in 1855, was thereby made the law here. On the other hand, it may be material to observe that the new Charter does not, like the preceding one, abolish the old Court, and introduce the law of England for the first time into new possessions, but only reorganises the existing tribunal by dividing it into two divisions and adding a second Recorder. It may also be important to bear in mind that since the date of the second Charter, a legislative body has been established in India, which legislates for the Straits, and that difficulties might arise in attempting to give effect at the same time to recent Acts of the Parliament and Acts of the Legislative Council bearing on the same branch of law.

How much of the English Statute law which was in existence in 1826, is in force here, is, in some measure, as I have already said, a question of construction. The effect of the Charter of that year is, it seems to me, to make the English criminal law in force "as far as the condition and the circumstances of the place and the persons admit"; the civil law, "as far as circumstances admit"; and that branch which is administered in England by the Spiritual Courts, "as far as the religions, manners and customs of the inhabitants admit". In other words, it makes just so much of the law of England our *lex loci* as, according to Blackstone, is imported into a colony newly founded by English settlers, viz: "as much as is applicable to the situation and condition" of the Settlement (a). If a law of the mother country, either from the end at

(a) 1 Comm. 107.

which it is aimed, or from the means by which that end is sought to be attained, is local in its character (*a*), or, even if it be not local, but injustice or inconvenience would arise if it were enforced in the Colony (*b*), it is not part of the law of the Colony. It was upon the former of these grounds that Sir W. Grant held that the Statute of Mortmain (9 Geo. 2.) was not in force in the island of Grenada. "What the Legislature had to consider", he says, "was whether, as there was so much of the land of England already in mortmain, it was not expedient to lessen the facility of putting more of it into that situation. That was a consideration purely local. It related to land in England, and to land in England only" (*c*). And in another part of his judgment, he points out that the provision requiring that deeds of conveyance to charitable uses should be enrolled in the Court of Chancery within six months of their execution, shewed that the act could not apply to a country which did not possess an enrolment office, since its requisition could not be complied with there; otherwise what was a qualified prohibition in England; would be an absolute prohibition in Grenada (*d*). So, it was partly on the ground of the inconvenience and injustice which would ensue from the enforcement of the English law which incapacitates aliens from holding land, that the Privy Council held that that portion of our law was not in force in India (*e*); and to all or some of the reasons above mentioned may be referred the different classes of laws mentioned by Blackstone as inapplicable to colonies; viz: "police and revenue laws, the mode of maintenance of the established Clergy, the jurisdiction of the Spiritual Courts, and a multitude of other provisions" (*f*).

Now, whether the Acts which provide for the punishment of labourers for wilful breaches of their contracts with their employers, come within any of the grounds which make statutes of the mother country inapplicable to this colony, is a question upon which I felt some doubt, owing chiefly to a passage in the judgment of the Master of the Rolls in the case just referred to, the Attorney General *v.* Stewart. Sir W. Grant there says: "Whether the statute of Mortmain be in force in the island of Grenada, will, as it seems to me, depend on this consideration—whether it be a law of local policy adopted solely to the country in which it was made, or a general regulation of property equally applicable

(*a*) 2 Mer. 162, 3.

(*c*) Attorney Genl. *v.* Stewart

(*b*) 1 Moo P. C. 277.

2 Mer. 143. 162.

(*e*) The Mayor of Lyons *v.* The East

(*d*) Id. 163.

India Company; 1 Moo P. C. 175.

(*f*) Comm. 107.

to any country in which it is by the rules of English law that property is governed" (a) If this were strictly correct, no English law would be a part of the law of any Colony, unless it were equally applicable to every country governed by English law. What colonists would carry with them to their settlements would be only such laws as were based on general principles of the widest application, and would not perhaps include among them some very suitable to their condition and very necessary to their wants. The Provincial Courts to whom it appertains to decide in the first instance whether the English statute is in force in the colony, would have to consider not merely whether, in the language of Blackstone, the law in question was "applicable to the situation and condition" of its own settlement, or was "neither necessary nor convenient" to it; but whether it was, in its nature of universal application in all English Colonies; a question which such a Court might often be very incompetent to decide, and have inadequate means of deciding. Having regard, however, to the manner in which the proposition is stated by Sir W. Grant, I do not think that he intended to lay down the law differently from Blackstone. He intended merely to decide that the Mortmain Act did not apply to Grenada, and he shewed that it did not, by shewing that it was, from its object and machinery, applicable exclusively to England. But after all, the question here must turn rather on the words of the Charter, than on the language of Sir W. Grant; and I think that all that I have to inquire is whether the act in question is applicable to the situation and condition of this settlement, that is, whether or not it is exclusively local in its object and in its machinery, and whether or not injustice or inconvenience would arise from enforcing it.

The Act certainly is not exclusively local in its object, which is to give an effectual remedy for wilful breaches of contract by a class of persons against whom the ordinary remedy of an action for damages is altogether illusory. The mischief is not peculiar to England. It is, in truth, probably less great there than in most of its possessions, and the remedy is not peculiar to England. The Bengal Regulations, for instance, provide a similar one in similar cases (b). I observe, also, that one of the earlier English statutes on this subject, the 20 Geo. 2. c 19, is included in a declaratory act passed by the General Assembly of the Bahamas, for the purpose of preserving to the Colonists those "many good and wholesome laws" of which, says the preamble, they had "sometimes been in danger of being deprived" in consequence of doubts entertained as to their being in all respects applicable to the circumstances and

(a) 2 Mer. 160.

(b) Reg. 1819. 7. § 75.

condition of the Colony (a). And it is there placed in the same catalogue with such acts as the Statutes of Merton, Westminster I & II, and Gloucester; with the 13th & 27th Eliz., (avoiding voluntary conveyances as against creditors and purchasers,) with the Statute of Frauds, the Habeas Corpus Act (31 Car. II.), and other enactments of a similarly general nature.

In the next place, so far from any injustice or inconvenience being likely to arise from enforcing this act of the 4 Geo. 4, it seems to me that both injustice and inconvenience would be the inevitable result, if some law of the kind were not in force here. From the affidavit sworn in this matter by some twenty gentlemen, comprising all the leading employers of labourers in the place,—European, Hindoo, and Chinese,—it appears that for all the ordinary heavy work of cultivation, as well as most kinds of skilled labour, the country is almost wholly dependent upon the natives of India, China and Java; that these men arrive indebted for their passage, and receive, on being hired, advances on their wages, varying from \$18 to \$25 for Chinese, from \$10 to \$12 for Klings, and from \$35 to \$50 for Javanese, (who are generally pilgrims on their way home); that from 4000 to 5000 Chinese, from 3000 to 4000 Klings, and from 1500 to 2000 Javanese arrive annually, but that few remain long in the country—the Chinese dispersing into the adjoining Malay and Siamese territories, the Klings returning home in three or four years, and the Javanese as soon as their engagements are completed; and that there is a constant demand for new labourers. It appears also, that from the facility with which even the poorest can obtain forest land for cultivation on their own account, labourers soon become disinclined to work for wages, and the desire of avoiding the repayment of the advances made to them on their arrival, is another motive for inducing them to absent themselves, or otherwise wilfully misconduct themselves in their employment.

From this statement I conclude that the Act is not only quite as applicable to the condition of this Settlement as it is to England, but that it is much more necessary to it; for not only is it more difficult to replace here a defaulting labourer by another, by reason of the scarcity of men, but also more improbable that damages should be recovered from the defaulters, since they are, as a class generally in the last degree of destitution. Besides, in many cases when a labourer in this place absconds, he not merely breaks his contract, but defrauds his employer of the advances made to him, since he refuses to repay them in the only manner in which he can pay them, by his labour. Indeed, so important, so essential I might say, do some such stringent provisions as those of the act in question appear to the welfare of this Settlement, that I fear I should deprive the community of one of those “many good and wholesome

(a) Clark's Col. Law. p. 368.

laws" to which it is entitled, if I were now to hesitate to hold that this Act was part of the law of the place. Lastly, the machinery by which the mischief is remedied, is not peculiar to England. It is in full force and operation here, for we have, under the Charter, both Justices of the Peace and a House of Correction.

Seeing, then, that neither the mischief, nor the means by which it is redressed, are peculiar to England, but exist here equally, and that no injustice or inconvenience can arise from enforcing the Act, I am of opinion that the 4 Geo. 4, c. 34 is law in this settlement.

I now come to the question whether the magistrate was right in deciding to adjudicate upon the case, on the ground alleged, viz. "that the jurisdiction given by him had been exhausted by the previous conviction." In support of this view of the Act he has undoubtedly the high authority of the Chief Baron, in *Ex parte Baker*. (a) In that case, the affidavits tendered to shew that the magistrate had no jurisdiction, stated that the prisoner had been previously convicted and imprisoned; that on his discharge he had not returned to his service, and that he had thereupon been again committed. "I have come to the conclusion," says Pollock C. B. "I must say satisfactorily to my own mind, that the legislature, by the the third section of the 4 Geo. 4. c. 34 did not intend that a workman should be put into prison more than once for not fulfilling his contract...I cannot help saying it appears to me contrary to the general spirit of the English law, and the administration of it, that a man should be punished thus over and over again, for what substantially is the same matter, and which for civil purposes, would be considered and adjudicated to be the same matter, and which would admit of but one action being brought in a common law Court in Westminster Hall (b)." This opinion is to some extent shared by Mr. Baron Martin, who in the same case stated it to be his impression that the nature of the offence must be looked to, that "if the offence be a man's absenting himself on a claim of right, and accompanied by a declaration that he would absent himself for good, that all that is but one offence, and ought to be dealt with as one;" while, if it was a mere absconding for a day or a few days, the case was of a different character and should be regulated by a different set of rules (c). On the other hand, both Bramwell and Watson B. B. expressed themselves very decidedly of opinion that the Magistrate might convict a second time for a second absenting. "I do not think", Bramwell B. observes, "that the first absenting, and punishment consequent thereon, was a dissolution of the contract. It may give to the master a right to discharge the workman. If he does not avail himself of that power of discharge,

(a) 26 L. J. M. C. 155.

(b) p. 168.

(c) p. 166.

the service continues, and there may be a second absenting himself from the same service" (a). Watson B. says: "when the imprisonment is over, he is still a servant; the contract continues, and his absence, again, is an absence within the Act of Parliament" (b). As, in this diversity of views, I am left to act upon my own, I adopt those of the last named learned judges. Even the Chief Baron does not absolutely deny that the second absenting is a distinct offence, for he qualifies his assertion by stating that the two acts are "substantially"; that is, I take it, "not precisely", one. It is perhaps true that, in practice, the repeated acts of misconduct would be treated as one offence, and that one action only would be brought in respect of them; but it would be difficult to maintain the proposition, that, in strict law, a second absenting is not a sufficient cause for a second action. If a labourer could not be punished for a second absenting, he would have a power which the law certainly denies to wrong doers in all other cases, viz. that of taking advantage of his own wrong; for he would be at liberty to rescind at his own pleasure his contract with his master, without the consent of the latter. But I do not think he has any such power. As far as he is concerned, the contract continues binding, and it is his duty to return to the performance of it at the expiration of his sentence. If he wants it rescinded, he must endeavour to persuade the magistrate to exercise in his favour the power which the act gives him of discharging the servant from his contract—a power probably given for the protection of the labourer, but which would have been wholly superfluous if the latter had actually rid himself of his obligation by once breaking it. The master, indeed, is at liberty to avoid the contract, and it was contended in *Ex parte Baker*, as in the present case, that on this account the man was not bound to return, unless requested to do so; but I think that the objection was satisfactorily met by the answer of counsel, in the case in the Exchequer, that if the contract continued in force as against the servant, a request to continue to perform it was unnecessary (c). It is clear that if the contract were not voidable by either party, the master would not be bound to give the servant notice to resume the performance of his part of it; and it seems to me that the privilege of rescission acquired by the master through the servant's misconduct gives no fresh right to the latter. The servant, by his default, can give his master the option of rescinding the contract, but cannot impose upon him the burden of a condition not contained in the contract. The only notice which the master is, under such circumstances, bound to give, is, not a notice of his adherence to the contract, but a notice of his intention to rescind it. Until

(a) p. 162.

(b) p. 160.

(c) *Id.* p. 158.

such notice is given, the servant is bound to treat the agreement as subsisting, and to continue to perform his part of it (a).

For these reasons I think that the magistrate ought to have heard and adjudicated upon this case; and the rule must consequently be made absolute.

(a) I was not aware, when I delivered this judgment, that a habeas corpus had been moved for in Baker's Case in the Queen's Bench, before the application to the Court of Exchequer. From the report of the case in the Q.B., it appears that all the Judges (Lord Campbell C. J. Coleridge and Erle J. J.) agreed in holding that the man's not returning to his service at the end of his imprisonment, was a second absentsing himself from his service, and that he might be again convicted and imprisoned. See 26 Law Journal Mag. Cases 193.

MINAHASSA

BY

DR. P. BLEEKER*

CHAP. 1ST.

FROM BATAVIA TO MANADO.

—o—

I propose to relate a short yet, in many respects, interesting voyage, which I made in the months of September and October 1855, in the suite of the Governor General of Netherlands India, Mr. A. J. Duymaer van Twist.

Since 1824, in which year the Governor General van der Capellen visited the Moluccas, none of his successors had been there. During the space of thirty years no Viceroy of Netherlands India had personally satisfied himself respecting the state of countries, by no means the least important of the Indian Archipelago; and Mr. Duymaer van Twist felt the necessity of a personal visit to those fertile islands, which for years had been so severely afflicted.

By Government Resolution of the 28th August 1855 it was resolved that I should accompany his Excellency on his voyage, in my professional capacity. This resolution was very agreeable to me, for, besides having the opportunity, during the voyage, of seeing a part of our possessions with which I was only acquainted from descriptions generally unsatisfactory and incorrect, I hoped to make new discoveries in a branch of Natural History to which I had for years devoted a large part of my time.

According to the plans of the Governor General, the following places in the Government of the Moluccas would be visited. We should first proceed to Manado, visit the interior of Minahassa and then embark at Kema for Ternate. From Ternate the

* Translated from Dr. Bleeker's "Reis door de Minahassa en den Molukschen Archipel, Gedaan in de maanden September en Oktober 1855 in het Gevolg van den Gouverneur Generaal Mr. A. J. Duymaer van Twist," Batavia, Lange & Co. 1856.

voyage would carry us to Tidore, Bachian, Amboina, Saparua and Banda, returning to Batavia. This plan was followed up, and short visits were also paid to the islands of Makian, Buru and Ceram.

Circumstances left me but little time for scientific researches in the several places we stopped at. At most of these we did not remain longer than a day or two, when only a few hours were at my disposal. Grand levees, official introductions, inspections, dinners and balls are every where the incidents of a voyage of a Governor General; and those attached to his suite cannot very well absent themselves on such occasions.

I am nevertheless enabled to report many remarkable things, and to correct many erroneous representations respecting the Moluccas. A look at a thing often teaches more than copious descriptions, because every traveller receives impressions of places visited, which are dependent on the direction of his investigations; impressions and ideas which generally embrace but a small portion of the whole. I have also been able to draw many particulars relating to the Moluccas from official documents and statistics, which his Excellency graciously placed at my disposal.

The private steamer "Ambon," commanded by Captain Hugenholtz, had been hired by Government at $f20,000$ per month, to convey the Governor General, and H. N. M. steam-ship "Vesuvius" was to wait for her at Menado, and to accompany her during the rest of the voyage. The Ambon was purposely fitted up for his Excellency and suite, and offered as comfortable accommodations as could be expected in steam vessels of her class. Although the berths of the suite were rather small, the want of room was amply compensated by a spacious saloon and cabin and a quarter-deck sixty feet long, while an exemplary neatness and cleanliness tended not a little to make the stay on board most agreeable.

The company consisted of the Governor General and his Lady,—the Government Secretary, late Governor of the Moluccas, Mr. C. M. Visser,—the Captain Adjutant, now Major-Adjutant, Mr. P. L. Bering Liesberg,—the Captain of Horse and Ordinary Officer Mr. E. C. de Casembroot,—Mr. Quarles van Ufford, Lieut. Royal Navy,—and Mr. J. F. G. Brumund, minister at Batavia, who had obtained permission to accompany his Excellency for the benefit of his health. At the Moluccas our number was augmented by Mr. C. F. Goldmann, Governor of the Moluccas, Mr. C. Bosscher, Assistant Resident, and Mr. L. de Stuers, Lieut. R. N. and Ordinary Officer, and further by the respective Residents of Menado, Ternate, and Banda and the Assistant Resident of Amboina and Saparua,—Messrs. A. J. F. Jansen, J. L. de Dieu Stierling, A. L. Andriesse, J. H. Tobias and W. Schmincke.

The embarkation was fixed for the 1st September, and fine weather favored the departure of the Governor General. The

earriage occupied by Mr. Duymaer van Twist and his Lady, was escorted to town by a detachment of Cavalry. At the landing place at Batavia were assembled the Vice President and members of the Council, the Lieutenant General Commander of the Indian Army, the vice-Admiral Commander of the Fleet in Netherlands India, and also the Chief Civilians and Officers to see the travellers off. A deputation consisting of the Secretary-General, the Military Commandant of Batavia and the Harbour Master accompanied his Excellency on board. The usual salute of 21 guns was fired from the Welkomst Battery and from the Guardship in the roads; the men-of-war manned their yards and the merchantmen hoisted their colours; and at eight o'clock A. M. the Ambon started from Batavia Roads. The voyage did not begin with very auspicious prospects, and even at Batavia representations had not been wanting to persuade the Governor General to postpone it. The Moluccas had but lately been sorely visited; the earthquakes which had raged during recent years were far from ended; even the newest intelligence informed us that the capitals of Ternate and Tidore had been partially destroyed. A fire had shortly before laid the greater part of the capital of the Banda Isles in ashes, and seemed to have filled up the cup of misfortune for those severely afflicted islands. The smallpox prevailed at Amboina and the neighbouring islands, and had already, within a few weeks, sent thousands to their graves. Piratical fleets had cruised about the Moluccan sea and spread terror and anxiety among the inhabitants; and there was no man-of-war steamer available to accompany the Ambon, in case of accidents.

But the Governor General was not the man to allow himself to be deterred by such warnings from the performance of his purpose; he felt that all those disasters were additional reasons for his repairing to their scene, where his arrival might revive and encourage the sufferers, and his benevolent hand alleviate the pressure of calamity.

The Ambon soon left the Roads of Batavia behind her, and steamed between the islets, which, like great flower-vases, display in the Bay of Batavia their everlasting green; verdant oases on the wide surface of the water, the sailor's guide and danger. I had often visited the finest of these islets and delighted in wading round them, among the coral reefs, which, like submarine gardens, vie in gorgeous colours and variety of form with the luxurious vegetation which crowns the islands themselves; and maintain a much more diversified population of seanettles, films, mollusks, crustacea and fishes than their scanty fauna offers.

The islands soon lay far behind, like green points, and we steamed eastward along the low coast of Krawang. The sea, calm in the Bay of Batavia, was raised into foaming waves by

the steady and sustained east wind of the dry monsoon, which diminished the progress of our screw to four knots, and made the ship pitch and roll disagreeably, causing some of us to feel the first symptoms of sea sickness. During the day we steamed along the coast of Krawang, under which several ships were lying at anchor, unable to beat up against the strong easterly wind, and waiting for the land breeze to continue their course. The low coast of Ujong Krawang* and Ujong Sedari soon came in sight, but the fog prevented our seeing the Krawang mountains,—Parang, Burangrang, Tangkubang prahu and Bukit Tunggul, the tops of which, in clear weather, are discernible far at sea.

Early on the morning of the 2nd September we steamed between Indramayu Point and the Boompies Islands. It was not till the afternoon of the 3d that we reached Mandelike, a rock to the north of the promontory of the Moriah or hill of Japara which we passed, at a few miles distance, bearing due south. The strong easterly winds which prevailed during the day, continued greatly to retard the progress of the Ambon, so that we only passed Bawean on the afternoon of the 4th, and between the Solombo islands on the 5th.

Bawean—also Baviaan—or Lubeck has a population of about 30,000 souls and belongs to the Residency of Surabaya, of which it is a division.† The western part of the island is higher than the eastern, but the interior rises higher still, reaching an elevation of about 2000 feet above the sea. Some conical mountain tops seemed to me to give to the island the appearance of a volcanic origin, yet sedimentary formations are not scarce, and it was once proposed to work the coal beds found there.

As we passed the island, the elevated parts of it became gradually hidden in more and more dense masses of clouds. The layers of air above the island becoming cooler as the sun went down, than the layers over the surface of the sea, the suspended moisture became condensed, first around the mountain tops and then over the whole elevated part of the island, into clouds, larger or smaller, which gradually packed themselves together, the disturbed electric equilibrium seeking to restore itself by flashes of lightning. The scene chained us to the deck in the evening.

The islets of Great and Little Solombo lie somewhat more northerly, but a great deal more to the eastward than Bawean, the latter lying nearly in the same latitude as Surabaya, while the

* For native words we use the ordinary European instead of the Dutch orthography. ex. gr. pulu for poeloe, tua for toewa, kichil for kitjiel, ujong for oedjong.

† See the articles on Bawean in the 1st part of the 8th year of the *Tijdschrift van Nederlandsch Indië*, and the 2d part of the *Natuurkundig Tijdschrift voor N. I.*

Solombos lie almost exactly to the northward of Banyuwangi or the straits of Bali. They are scarcely a mile apart, Great Solombo or Nusa Sumbo being to the southward of Little Solombo. They are but a few miles in circumference, consist apparently of reefs, are low, yet, in the southeast part of Great Solombo, there is a small cone about 300' high, perhaps the top of a volcano, the greater part of which has sunk into the sea, and on whose slopes the polyps have built their reefs. Though covered with a rich vegetation they are both uninhabited, and the largest only serves now and then as the resort of pirates, who repair their praus there and take in fresh water. Buffaloes should be found on Great Solombo, having been left there by order of the late Sultan of Sumanap.

Between Bawean and Solombo we saw the first seabirds, a few gulls, and also some flying fish (*Exocoetus unicolor* CV. and *Exocoetus oxycephalus* Blkr.). As we proceeded the sea showed more life. Now and then porpoises, singly or in numbers, sported about the ship in shorter or longer lines. Tunnies and bonitos (*Thynnus thunnina* CV., *Thynnus tonggol* Blkr., *Thynnus pelamys* CV., *Auxis thynnoides* Blkr.) sometimes sprang in shoals out of the water, or moved about entirely on the surface of the sea, their bodies rising only partly above it, but recognisable at a considerable distance by the peculiar agitation which their shoals create in the water. At times we saw large sharks swimming about quietly, and only occasionally betraying themselves by the appearance above water of their dorsal fins. The flying fishes at times formed swarms of many millions, and we often steamed for hours together before passing these shoals. Surprised by the enormous body of the steamer and the commotion of the sea caused by the rapid revolutions of the screw blades, they flew out of the water along the ship in a direction towards the stern, making an angle of about 45° with the hull. They could not, however, keep themselves long above water, and they only rose to a height of three or four feet to dive again ten to twenty yards off. The different species of flying fish (*Exocoetus*)—of which at present nearly forty are known—possess the power of keeping themselves, flying or hovering, above water, in different degrees. This power is dependent on the size of their pectoral-fins and partly of their abdominal-fins; but while some species, such as *Exocoetus unicolor* C. V., *Exocoetus speculiger* C. V., *Exocoetus oxycephalus* Blkr.,—all of this part of the world—have the pectoral fins so long that they reach to the tail, others have them so short, that they are incapable of supporting the body or of moving it in the air, such as *Exocoetus micropterus* C. V. of Buru, Amboina &c.

In the Moluccan sea, our voyage was further enlivened occasionally by whales, probably Cachelots (*Physeter macroce-*

phalus) which we saw at some distance from the ship.

On the 6th September we neared Pula Matasiri. This island is the southernmost of a small cluster, to which Laurot or Laut Kichil also belongs. It is about half a mile long from east to west, and rises a few hundred feet above the level of the sea. We had scarcely passed Matasiri when we sighted Pula Laurot, which is larger and more elevated, but was less distinguishable on account of its great distance.

By break of day (7th Sept.) we were near Nusa Lima or Nusa Sirih. These small islands, five in number, lie in a row from north to south, and are apparently coral reefs covered with vegetation, flat, small and uninhabited. The sea was calmer than it had been during the first days of the voyage.

Not far from Nusa Lima we caught a shark, from the poop, with a line to which was attached a hook baited with feathers. It was fully one and a half Dutch ells long, and belonged to the family of *Carcharias*, and to that division of it which has teeth on the sides of the teeth (*Prionodon*). This species was new to science. I named it *Carcharias* (*Prionodon*) *amblyrhynchos*, from its short broad snout. I described it whilst alive,* and when dead prepared its head and skin for my cabinet of natural objects. This sort of shark is very tenacious of life. Blows with a handspike dealt on its head by a strong sailor with all his might, did it but little harm. On opening the animal we found the stomach empty, so that it seems to have been driven by hunger to bite the hook. In the parts where we caught the shark we saw neither flying nor any other species of fish. When later in the day, we caught a saltwater pike (*Sphyræna jello* C. V.) we found its stomach also empty.

After passing Nusa Lima, we steered more to the northeast for the west coast of Celebes. At day break next morning we saw the highland of Mandhar before us, and began to hold a more northerly course, in order to steer for Manado through the straits of Macassar along the west coast of Celebes and afterwards along the north coast.

Cape Mandhar is known to seamen as somewhat dangerous, owing to the occasional suddenness of the strong winds which prevail there. We had the benefit of one of them, when a strong north-easter obliged us to take in all sail, and scarcely gave us time to do it. This seems to be a frequent occurrence. It is easily explained by the great land mass of Middle Celebes, which is very mountainous at Mandhar, and rises thousands of feet above the level of the sea, in ridges visible in the back ground from the straits of Macassar. The powerful radiation

* *Natuurkundig Tijdschrift Voor Nederlandsch Indie* Vol. X. 1856.

of heat from these mountains cools the layers of air resting on them, and the air becoming denser descends to the sea and displaces the warmer air from its surface. This displacement proceeds with the more rapidity, in proportion as the thermometrical equilibrium of the body of air above the land and the water is strongly disturbed. My prediction that the wind would fall as the sun rose was soon verified, for at 8 o'clock A. M. it decreased in force and at 10 o'clock A. M. it was a perfect calm, which was gradually succeeded by a soft sea breeze.

The scenery on the coast of Mandhar along which we steamed during the whole day, is very beautiful. Mountain ridges rise behind each other, with irregular and broken summits, and give to the scenery a different appearance from that which Java derives from its volcanic cones. We feel that a wholly different land lies before us, a country of more ancient formation than Java and probably rich in minerals. But Mid Celebes is as little known as our power there is weak. We have a little knowledge of the peninsulas projecting towards the north and south, but the centre—some parts of the coasts excepted—remains almost wholly unknown. The desirableness of a scientific expedition thither is undoubted, as well for the sake of a knowledge of the country, as for the extension of our authority.

Steaming along the coast of Mandhar, we enjoyed the beautiful prospects of the hills, all covered with a varied vegetation, rising immediately behind the beach, and only leaving small open spots here and there. Wildly scattered about, they open roads over their steep ridges or through deep ravines, to the interior, where grander and grander mountains rise. It is certain that this physical condition of Mandhar is a principal cause of that longing for independence which prevails among its inhabitants, who distinguish themselves by a spirit of enterprise not very common in the Indian Archipelago, voyaging far from their inhospitable coasts to employ themselves in trading and trijang fishery on the reefs of foreign seas. The Mandharese did, however, not long ago, acknowledge a certain political subordinacy to Boni, but like Sidenring, Tanette, Barru and Torathea they made themselves independent of that state in 1854. They had long before settled at different places on the long promontory of the northern peninsula of Celebes, where many places, as Sogenti, Taäda, Kasimber and Amphibabu are under Mandharese chiefs.

We remained in sight of the coast of Mandhar the whole day and could see the people in the scattered villages with the spy-glass. Towards evening we reached Cape William, north of which the coast retreats more to the eastward and is lower.

The sea from here to the Northward of Macassar Straits, was very calm, there being but little wind. These calms are well

known to nautical men and the commander of the Ambon, Capt. Hugenholtz, had told us about them, when we were beating up against the east monsoon in the Java Sea, and the ship knocking about, making many of us seasick. They are easily explained from the circumstance of the Straits of Macassar having in its northern half only a mean breadth of two degrees, (at the outlet between Cape Donda and Cape Kaniangan scarcely one degree); and being surrounded by the two great masses of land, Celebes and Borneo. Even if the regularity of the land and seabreezes of both Islands be not impeded by these two masses, these winds cannot in ordinary circumstances acquire any great strength, since the cool currents of air of the two islands, meet and oppose each other's progress, whilst during the heat of the day, the cooler sea air will run westerly to Borneo and easterly to Celebes.

On the 9th September at sunrise we were opposite Cape Pas-sangkayu belonging to the small kingdom of Kayeli which in 1854 acknowledged our sovereignty by treaty. The coast is hilly and covered with tall trees. Behind these hills the eye loses itself in extensive plains, which in the back ground, pass into a mountain chain, stretching from North to South. This chain has no volcanic appearances and has but few remarkable summits whose heights I estimate to be about 4000 feet.

About noon we were opposite the Bay of Palos. The kingdom of Palos consists of the isthmus, which separates the northern peninsula from central Celebes. From the capital Palos, lying on the bay of that name, there is a road to Parigi, a commercial town to the southward of the bay of Gorontalo, noted for the gold and the excellent horses which it exports. It is said that there is also a road from Palos through central Celebes to Boni. If Dutch power be extended over central Celebes, which is certainly much to be desired, Palos or Parigi seems to be the most favorably situated spot for a Resident or a Governor; but Palos seems to deserve the preference, being placed on a great commercial road, and having a considerable population. In the Bay of Palos alone, the villages of Palos, Dongola, and Tawali, contain more than 20,000 souls. Should a political and scientific expedition be ever decided upon, Palos seems to be the best point from which to commence operations. Having passed the Equator in the evening we were at sunrise of the 10th September near the islet Northwatcher, the most northerly and most westerly of the low and uninhabited Seven-islands. Between these small islands and Cape Donda situated a few miles more northerly, the coast rises again and the eye looks inland on mountain tops which may be estimated at 5000' high and which at Cape Donda are according to Martendall, 9694 English feet or 2801 metres. We had now passed the Straits of Macassar and having rounded Stream

Cape in the evening, we steered an east by north course for Menado. In the Straits of Macasser we only saw three vessels, namely a Chinese Schooner, an English Whaler and a strangely rigged craft, which last looked rather suspicious. Whalers often visit the Straits of Macassar for cetaceous mammalia. We did not, however, meet with any of these animals before we were in the Molucca sea. The suspicious craft was a prau badly rigged but well manned and heavily armed. When she saw us making for her, she endeavoured to avoid us and to get close in shore, but finding that she could not succeed, she kept her course and hoisted Dutch colours, whilst only part of the crew remained on deck, and on passing the Steamer they shewed themselves as common native sailors.

On the 11th September we steamed into the sea of Celebes, and steered for the small island of Menado Tua. About noon we lost sight of land and at sunrise on the 12th we reached the above island, which together with the islets Bunakin and Siladin, protects the bay of Menado on the north. We soon entered the roads of Menado, after a long passage of eleven days. But the voyage had been most pleasant and was rendered not a little agreeable by the affability of the Governor General and of his excellent Lady.

ETHNOLOGY OF THE INDO-PACIFIC ISLANDS.

THE AFFILIATION OF THE TIBETO-BURMAN, MON-ANAM, PAPUANESIAN
AND MALAYO-POLYNESIAN PRONOUNS AND DEFINITIVES, AS VARIETIES
OF THE ANCIENT HIMALAYO-POLYNESIAN SYSTEM; AND THE
RELATION OF THAT SYSTEM TO THE DRAVIRO-AUSTRALIAN.

The revisal of the Mon-Anam division of my enquiries into the history of the Himalaic languages was interrupted early in 1857 when the greater portion of the annexed pages (153 to 176,) had been printed. Some months later, not having any prospect of being soon able to give to the subject the continuous attention necessary to satisfactory progress, I sent copies to a few ethnologists. On returning to it about the middle of last year, I endeavoured, before proceeding with the printing of this section, to reconsider the question of the relation of the Kol to the Mon-Anam and to the Dravirian groups, and to ascertain with more exactness the extent of the glossarial connection between Dravirian and the older Himalaic dialects of the south. I began with a reexamination of the Kol dialects and those adjacent ones of which vocabularies have recently been published, but I had not advanced far before I saw the necessity of tabulating and analysing the whole body of the Himalaic definitives and particles as I had done the numerals. The extreme difficulty of comparing different systems of monosyllabic definitives, when the phonetic forms are unstable even in the same family and in the same group of dialects, had previously deterred me from doing more than indicate the general resemblance of the Himalaic to the Dravirian on the one side, and to the Scythic on the other. But further progress had become impossible without an attempt to determine how far the Kol system was Himalaic, and how far Dravirian. Without entering, for the present, into the question of the ultimate relationship of the Himalaic and the Dravirian, it is sufficient to know that, notwithstanding a large and radical affinity, the systems have been distinct from the monosyllabic era. The two families have not separated since they became agglutinate. The oldest ascertainable forms of both are so distinctly demarked that it is quite possible, in most cases, to determine whether a Kol particle be Dravirian or Himalaic.

So long as the single character of monosyllableness was held to be sufficient to unite the Mon-Anam with the Chinese langu-

ages into one family*, the glossarial peculiarities of each division, however great, were merely a proof of the vast lapse of time during which it had existed independently of the others. At first, therefore, I saw nothing anomalous in the possession by the former of pronouns and numerals distinct from the Chinese, the Tibetan and the Dravirian, and, finding some of them in the Kol dialects, I naturally attributed their presence to an early western movement of Mon-Anam tribes into the Gangetic basin.

When the proofs of the special Tibetan affinity of the Mon-Anam tongues accumulated on my hands and I began to see that they were essentially Tibetoid dialects of an archaic character, transformed by the influence of Chinese, it was no longer possible to believe that this group had possessed a radically distinct system of pronouns and numerals. The peculiar roots were clearly not variations of the Tibetan. They were not Chinese or Scythic. But the substitution of a plural labial particle for the singular pronominal root in some of the Dravirian forms, appeared to offer the key to the labial pronouns of the adjacent Kol; and the conclusion that the latter were dialectic corruptions of Dravirian, involved that of the derivation of the Mon-Anam singular pronouns from them.

My analysis of the Himalaic definitives and pronouns as a whole has satisfied me, that while it is true that the peculiar Kol-Anam forms have been produced by the replacement of the root by plural, directive and honorific particles, these particles themselves are Himalaic and not Dravirian. The radical identity of the native pronouns, definitives and numerals of the Kol with those of the Mon-Anam group is thus established. Both groups, in their glossarial basis, are branches of one formation much more akin to Tibeto-Burman than to Dravirian. Draviriod as the Kol dialects are in phonology and in much of their grammar and vocabularies, they are radically South Himalaic of the older or Mon-Anam type. Near-alike in geographical position and in form—as the Mon-Anam languages are to the Chinese, they are but disintegrated Kol of the ancient form.

The primary Himalaic system of pronouns and definitives, was—like all other early systems—very elaborate and cumulative. The pronominal distinctions were multiplex; and numerous definitive roots and combinations were necessary to express them. 'The true pronouns,' I may repeat here, 'are

* In the first stage of generalisation—at which Prichard rested—all the known Ultraindian tongues e. g. Burmese, Siamese, Anam, were indiscriminately classified with the Chinese and Tibetan (Bhotian), the apparently common character of monosyllableness being considered as a radical and permanent one and the consequence of a community of stock.

themselves but definitives appropriated to the speaker and hearer; and all the distinctions of genus and number, of relative position, time, power and dignity, which the Himalaic definitive system was capable of expressing, were liable to be engrafted on the simple *I* and *Thou*. Many of the forms were merely intended to give greater distinctness and emphasis to the pronominal idea. In all families the progress of agglutination leads to the disguise of appended particles, and to the disuse of the full forms of simple and compound roots,—the fragment retained, in the case of compounds, being, not infrequently, a secondary, instead of the principal, particle. Definitives of genus, number, case &c. replace the pronominal root; and one of the most important consequences of this is, that the same secondary root is found as a current pronoun in different persons. A comparison of all the existing Himalaic systems, for which data have been published, shows the irregularities to be exceedingly great; but these are reconciled by the establishment of the true character of the primary system, and the recognition of a few leading varieties in the widely diffused dialects.

This expansion of the Himalaic pronominal basis, so as to include the numerous and varied roots and forms of Kol, the Mon-Anam group and the Tibeto-Burman dialects, is attended with a further and even more important consequence. The Malayo-Polynesian pronominal system is neither Kol, nor Mon-Anam, nor Tibeto-Burman; but the moment we recognize Himalaic, in this older and richer form, it is seen to embrace the Malayo-Polynesian pronouns; while the insular system ceases to perplex us by its varieties and anomalies and brings us close to the primary *Himalayo-Polynesian*. The relation of the Dravido-Australian to the earlier South Himalaic or Gangetic formation also acquires a new interest. A brief retrospect will best show the advances now made on my previous conclusions.

My first comparison of the Oceanic with the Continental tribes and languages, led to the inference that the oldest population of the southern provinces of the Old World—the Semito-African, Irano-Indian, and Oceanic—had a special character in physical conformation, language and civilization. This I termed African and Indo-African, because its best modern representatives are found in the African and Indo-Australian regions. I attributed the wide prevalence of this ethnic development not to migrations from Africa to Asia,* but to the dispersion of hordes from the

* Both Mr. Hodgson and Dr. Caldwell have misunderstood some passages in my earlier chapters, from overlooking the fact that I used and defined the terms African and Indo-African as indicative of race and not of geographical position. See Note p. 70

great Mid-Asian province in ages when the linguistic types prevalent in it had that highly pleonastic, agglomerative and harmonic character which I have often indicated by the term *protoscythic*. The oldest formations of Asonesia, India and Africa were of this character. The Indian Archipelago, Australia and Papuanesia were occupied by a branch of this ancient Indo-African population. The languages of the Oceanic branch belonged to a stage intermediate between the monotonic and the inflectional, and having strong and direct affinities with the other families in the same stage,—the Ugro-Tartar, Japanese, ancient Indian and African, and, to a certain extent, with the American,—the last being a peculiar outlying family. I remarked that in Asonesia the Formoso-Philippine and the Australian were amongst the best preserved examples of these archaic Oceanic languages; that some of the eastern Melanesian dialects would probably be found to be equally characteristic; and that both the physical affinities and those in language and customs, between the Australian and the other Indo-African tribes of Asonesia, are strong and decided. It appeared to be probable that the Australian and many of the Papuan tribes were derived from India through Ultraindia. It is true, that along with an ancient ethnic basis of Asiatic origin, common to Africa and India, I thought, as I still think, it probable, that the civilisation of eastern Africa and Arabia had, in its successive forms, influenced the populations lying on the eastern side of the Indian Ocean. But the only African migration which appeared to me to have communicated an important element, physical and linguistic, to the Papuanesian formation was the Malagasy. I held the Malayo-Polynesian linguistic formation to be simply decayed Papuanesian of the Malagasy type modified by the native Australoid, but the Malayo-Polynesians themselves to be Tibeto-Anam or southern Himalayans, derived from Ultraindia and India at a period when they were still deeply imbued with the Indo-African development. The Tibeto-Indian languages spoken by them in their native seat I considered to be represented by the Gangetic dialects, and to have been associated with the archaic African and Asonesian tongues. The proto-Gangetic languages appeared to have been more archaic than the Tibetan and the Tamulian, and their ideologic connections were probably wider.*

In my rapid review of the variable characters of the Asonesian tongues, I referred their existing forms to the blending of successive systems. The agglomerative, pleonastic, harmonic, cohesive and postpositional Australian was followed, except in Australia, by other systems,—the Papuan,—“having a different but equal-

* Ethnology of the Indian Archipelago, *passim*, (J. Ind. Arch. IV, 252 &c. June 1850).

ly high, and in some respects a higher development, and strongly distinguished from it by their vocalic and prepositional character." To the Papuan or Malagaso-Australian systems succeeded a very crude system, of Ultraindian origin—prepositional and direct in structure like them—which is now predominant in the West Indonesian tongues, and deeply penetrates those of East Indonesia and Polynesia; while in North Indonesia, Micronesia and probably in some parts of Papuanesia, the older Papuan ideology is still the more powerful element. The persistence of a marked Australian element in the East Indonesian family—comprising not only the East Indonesian or Bima-Aruan dialects, but the West Sumatra insular band, and several of the best known of the remote Pacific tongues, Tarawan, Rotuman, Viti—was indicated; and the information we then possessed respecting the Papuanesian languages led me to think it probable, that the peculiar East Indonesian traits found in dialects spoken both by Papuans and Malayo-Polynesians along the boundary between Papuanesia and Polynesia, while distinguishing them from Polynesian, connect them with Papuanesian. I added, that since, in islands so distant from each other as Ende and Tarawa, the great East Indonesian band has decided Australian connections, it might be anticipated, that the Papuanesian languages, from New Guinea to New Hebrides, also retain Australian traits. I noticed the remarkable affinities between the complex pronominal systems of Bima-Aruan, Tarawan and Australian, and the possession by the two former of the habit of pleonastically uniting the pronoun to the verb, and, in some of the Bima-Aruan dialects, to the noun,—a trait neither Australian nor Malayo-Polynesian.*

Some years later, (1855), when analysing the Dravirian glossary, I observed that "the Australian and other Asonesian affinities of the ancient Indian languages extend to all those that still remain, and are not confined to the South Indian. On the contrary they appear to have been mainly with the ancient Gangetic languages, and even those Asonesian vocables that are now found in South India only, were probably derived from Gangetic vocabularies which have since lost these words, or have themselves ceased to be spoken. The Asonesian vocabularies also contain numerous words of a similar phonetic structure to the ancient Indian, but which have no representatives in any known Indian language now existing, although they have Scythic, North Asian, Iranian, Caucasian or Semito-African affinities. Allowing for those that may have been received directly from the Malagasy and East African formations and from Japan, the great mass doubtless found their way to the islands through the basin of the Ganges and Ul-

* Characters of the Indo-Pacific languages, *passim*. Journ. Ind. Arch. 1851.

traindia; for their diffusion in the most ancient insular vocabularies, including the Australian, must have long preceded the era of a direct navigation between Southern India and Ultraindia or Indonesia." The affinities of the Dravido-Asonesian tongues with Semitic and African, I concluded to be "mainly indirect and referable to the common Mid-Asiatic element." It was stated that the influence of a Gangetic sub-formation akin to the Kool is still distinctly traceable in Indonesia. In another place it was remarked that the Papuan vocabularies of Torres Strait preserved a very early variety of the Papuanesian glossary, and that it had a highly Scythic character. The other Asonesian vocabularies have a basis of similar archaic Scythic and Scytho-African words, but the older words have, in general, been replaced by vocables derived from the later intrusive formations, Malagasy and Ultraindian. "Both of these, and especially the Ultraindian, being very Scythic in their glossaries, it is often doubtful by which current Scythic words found in Asonesia were imported; and it is still more difficult to distinguish the archaic Dravido-Australian from the more recent Ultraindian terms of Scythic origin, the difficulty being increased by the fact of Ultraindia having been the line by which both of these Scythic currents have flowed to the islands." The most ancient Asonesian pronominal system—variously preserved in Australian, Polynesian, Viti, Tarawa, Tana and some of the Indonesian tongues—was agglomerative. It had evidently not been derived from Malagasy, and its presence in Asonesia was attributed to a prior formation, of Indian origin, similar to the Dravirian, but richer in forms, because simpler and less concentered. The Dravirian or Dravido-Ultraindian origin of the labial 2nd pronoun of Malayo-Polynesian (which is also an element in the exclusive plural of the 1st) was pointed out.

My previous review of the known Tibeto-Indian dialects had led me to distinguish, in many of the southern dialects, a phonetic and ideologic element greatly in advance of the crude Bhotian. This ancient harmonic formation of the Gangetic plain, "more archaic than than the Tibetan [Bhotian] and Tamulian," and of which Bodo and Dhimal were then the best representatives, I designated Gangetic; and I attributed its decay in most of the dialects, from Tiberkhad to Mishmi, to the comparatively modern influence of the intrusive Bhotian. This formation appeared to me to have resulted from the advance of the first Tibetan tribes into the Gangetic valley, at a period when its native population and language were Dravirian. †

† Mr. Hodgson, in one of his latest papers, says that he cannot sub-

I, therefore, recognized three non-Arian linguistic groups in India,

scribe to my doctrine of a separate Gangetic sub-family of Turanians. "Very remotely divided *times* of Turanian immigration may be conceded, but not totally sundered *routes*, and still less such broad distinctions of race among the immigrants as seem to be contended for.....It may be that the Ugric stock of the immigrants found their way into India by rounding the N. W. extremity of the Himalaya." And in another place he says that "it may well be that some of the sons of Tur entered by the Arian route, and that these were among the earliest immigrants, whose more Westerly abode and point of entrance into India is still indicated by the higher structured tongues of their presumed descendants." This admits nearly all I have contended for in opposition to Dr. Prichard and himself. I may also observe that I have never spoken of immigration from Africa as affecting the physical character of the Indian population, or trenchantly demarked the Gangetic race from all the priorly recognized ones. On the contrary, I have all along pointed to Mid-Asia as the source whence the ancient Indian and Asonesian like the African races were derived, by successive movements, at widely different times. I have maintained that the normal physical type of the Dravirians is of a character higher than the Mongolic, that it is more Iranian and Semitic, and that it resembles the finer African more than any other. The Draviro-African type is undoubtedly distinct from both the Turanian and the Iranian. It is true that the lower African, Indian and Asonesian type is more Turanian, but it is also well distinguished from the proper Turanian. I have not entered into the question of the ultimate unity, or otherwise, of the various physical varieties of man. However those varieties arose, when once produced they have shown a great tendency to permanence. It is probable that, in an early era of human civilisation, the descent of savages of Turanian or of a base Iranian type from elevated and temperate provinces in the north to low, hot and humid ones in the south, produced the older negro type. But be this as it may, I consider it certain, from linguistic evidence, that the oldest Draviro-Australian and African populations were derived in different eras from S. W. Asia. Far from surmising that India was originally peopled from Africa, I simply put forward the hypothesis that, in eras preceding the southern advance of the Semitic family, "southern Arabia and the adjacent southern seaboard of Persia may have been occupied by tribes and languages connecting the Turanian with the Indian, on the one side, and the African, on the other." I have used the term "African" as descriptive of a particular human type, and in speaking of the Dravirian as African it was obvious from the whole context that I did so in this sense. The ancient "Gangetic" race I have always held to be Tibeto-Indian, i. e. Tibetans modified by the prior Dravirian race and by the climate of the plain. In the earlier and more barbarous ages of Indian and Asonesian history I believe that the Australian and Papuan types prevailed to the south of the Himalayas. The Papuans are more Turanian than the Australians and the lower Dravirian castes, and as the Papuanesic languages are Himalaic more than Dravirian, it is most probable that the earliest Tibetan immigrants into the valley of the Ganges gave rise to the Papuan variety of Turanians, just as the earliest proto-Seythic (Seytho-Cauca-

1st, the Tamulian [Dravirian], 2nd, the Tibeto-Indian or Gangetic 3rd, the Tibetan [Bhotian]. Placing the Dravirian aside as a distinct formation, more Scythic than Tibetan and of N. W., not N. E., derivation, the postpositional languages of Ultraindia (Burman &c.) were classified with the Gangetic and sub-Himalayan as Tibetoid; and the whole of this southern Tibetoid alliance was divided into three branches,—an archaic Gangetic or Tibeto-Tamulian, a Burmanic, and a modern or Bhotian; the Bodo, Dhimial and Garo were removed from Mr. Hodgson's Tamulian family and placed in the first of these branches; and the postpositional or Tibetoid Ultraindian dialects (Burman &c.) were strongly separated from the prepositional,—(Mon, Lau, Kambojan, Anam, Khasia in part), the latter being closer to Chinese. Burman was considered to be a link between the Lau-Chinese and Tibetoid families (1850). ‡

The old opinion as to the true classification of the more monosyllabic dialects of Ultraindia, Tibetoid as well as Mon-Anam, was altogether abandoned by their being held (1852, 53) to be radically dissyllabic,—i. e. the vocables consisting of a root and a prefix or postfix,—and to have been metamorphosed by the progress of an emasculative phonology like the Chinese. The Naga-Manipuric were considered to be better representatives of the proper Tibeto-Ultraindian type than the modified Burman which had intruded into the ancient Yuma province. The distinctive feature of the Gangetic band of Tibetoid dialects was found in harmonic, pronominal and pronominalising traits common to them

ian &c.) movements into Arabia and Africa produced the African, and those into India the primary Draviro-Australian.

‡ Both the linguistic development represented in India by the ancient Gangetic tongues and the Ugro-Tamulian "connect themselves in the strongest manner with the Chinese." *Ethnology of the I. A.* (1850) "Chinese is, ideologically, the most central of all the languages we have hitherto adverted to." *Ethn. of the I. P. Islands* (1853). "The Tibeto-Ultraindian [pronominal] roots present only some slight dialectic variations from the Chinese; and as respects pronouns, definitives and other particles, the formation may be considered as a Chinese dialect, or rather as forming with Dravirian and Chinese, dialects of one mother tongue." *Ib.* (1853) "The most marked feature of the Dravirian system of pronouns and particles is its combination of Chinese and Tibetan roots with a Scythic phonology and structure, and with some Scythic roots that are not Chinese. In its cruder and less agglutinate archaic form, of which Australian is partially a representative, its true place appears to be between Chinese and Scythic. The radical affinities of the system with Tibeto-Ultraindian are close and unequivocal. In roots the two are the same, and both are Seytho-Chinese, and much more Chinese than Scythic. The Dravirian and Australian forms do not appear to have been directly derived from Tibeto-Ultraindian." "The affinities between the Draviro-Australian and the Tibeto-Ultraindian system are the necessary result of their both being Seytho-Chinese." *Ib.*

with Naga, and which appeared to indicate a Dravirian influence. *

I separated the Kol group of Vindhyan dialects from the Male and Uraon, the two latter being considered as still mainly Dravirian, while the Kol was held to be Dravirian considerably modified by Ultraindo-Gangetic, particularly in its glossary. The Kol pronouns and numerals appeared to be Mon-Anam.

Mr. Hodgson's Sifan papers indicated affinities between these newly discovered dialects and Caucasian on the one side and Malayo-Polynesian † on the other, while they threw a fresh light

* Bhotian itself appeared to me to be Chino-Scythic; in structure Scythic, with some exceptional traits common to Tibeto-Burman and Mon-Anam—e. g. prefixes, the position of the qualitative (including the numeral) after the substantive—; in phonology intermediate between Chinese and Scythic, i. e. combining non-harmonic and monosyllabic traits with agglutinative and dissyllabic. The use of definitives and directives as assertives, the substantival character of some of the directives, the great number and variety of auxiliary relational particles or formatives, and the habit of compounding them, were prominently noticed. In this habit of the Tibeto-Burman family I found "the basis of the agglomerative formatives of the Scythic, American, Euskarian and African systems," the last including, as I then conceived, the Malagaso-Polynesian. The relation of this great proto-Scythic alliance to the Himalaic was afterwards more particularly considered. The Semito-African (including Caucasian) and the Malayo-Polynesian or Papuanesian families, closely connected as they are in structure, roots and phonology, may now be described as two separate branches of the Himalayo-Scythic or archaic harmonic formation of Mid-Asia, which were thrown off at a very early period to the S. W. and S. E., and by their peninsular and insular positions escaped the influence of the postpositional Scythic or Tartar family, which afterwards predominated throughout Upper Asia. A distinct branch was early thrown off from the opposite or N. E. extremity of the continent into America. There are still in Upper Asia remnants of archaic proto-Scythic languages akin to the Himalayo-Polynesian, Semito-African, and American, e. g. Yeniseian, Yukahiri, Koriak, Kamschatkan with the adjacent Aino-Kurilian.

† Mr. Hodgson's general inference was that "the Indo-Chinese, the Chinese, the Tibetans and the Altaians have been too broadly distinguished and that they form in fact but one great family, which moreover includes what is usually called the Tamulian element of Indian population as well as nearly every element of the population of Oceanica." In a note he added "the elder Oceanic element or Alforian=our Tamulian and the analogous dispersed and subdued tribes of Indo-China and China; the younger Oceanic element or Malayo-Polynesian=the now dominant tribes of Indo-China, China, Tibet and Himalaya." This substantially follows my first conclusions, if we exclude the secondary African ingredient which I have now abandoned. On physical and linguistic grounds I have always included the Chinese and Indo-Chinese in the great Turanian alliance, but it is so vast, and in its oldest form so universal, that ethnology consists of little else than the determination of the distinctive

on the history of the Tibetan family generally. Comparing the Sifan with the southern dialects, I found that they were closely related to my earlier or Gangetic branch, while they enlarged the glossarial connection between it and Mon-Anam. Their harmonic character indicated that the archaic Tibetan form was more Scythic in phonology than the modern Bhotian, and this, with the non-Bhotian pronouns, rendered it probable that in the allied Gangetic and Gangeto-Ultrindian tongues most of the traits that I had formerly considered Draviroid were really of archaic Tibetan derivation.

Finally (1856), the postpositional Tibeto-Burman and the prepositional Mon-Anam, were united into one alliance, the Himalaic, having the same pronouns as Chinese and Dravirian and many other similar roots, but with the general vocabulary more Scythic than Chinese, and very slightly Dravirian; having, in its radical form, some structural traits that distinguished it both from Chinese and Scythic; but having in West Himalaic (Tibeto-Burman) received a strongly Seythoid development; while in East Himalaic (Mon-Anam) it had remained more Chinese in roots and structure, but acquired some Dravirian pronouns, numerals and other roots, chiefly Vindhyan, owing to its having preceded Tibeto-Burman in India.

The anomalous pronouns and numerals of Mon-Anam being now traced to a native origin, the older Himalaic formation of the south assumes a more distinct and homogeneous form, and its history begins to emerge from the obscurity in which it has hitherto been involved. What has until now been the great difficulty in the philology of South Eastern Asia, not only furnishes the true link between the Tibetan and Scythic men and tongues and the Polynesian, but presents us with a more striking example of linguistic metamorphosis than is elsewhere to be found. While Kol, under Dravirian influence, remains harmonic and pronominalised and has become more agglutivative and polysyllabic,

characters of the various families or sub-families of which it is composed and of their genealogic relations. I distinguished three elements in the insular population and languages, 1st, the Australian [or Alforian, one of Prichard's terms based on a misconception]=proto-Dravirian; 2nd, Papuan=the older Ultrindian and Indian + Malagasy; 3rd, Malayo-Polynesian=the Tibeto-Indian and T. Ultrindian. Mr. Hodgson appears to comprise the Australian and Papuan elements in his Alforian class, so that it is not identical with Prichard's. Any classification or genealogy, however, which identifies the Papuans with the Australians and separates them from the Malayo-Polynesians is imperfect. Physically and linguistically the Papuans, although allied to the Australians, differ so much from them as to constitute a distinct family or sub-family of Turanians. Linguistically the Papuan formation is the basis of the Malayo-Polynesian.

Anam, under Chinese influence, has become purely monosyllabic and tonic. ‡

Hitherto I have considered the Malayo-Polynesian pronominal system, although Gangetic in origin, form and some of its roots, to possess a Semito-African element,—derived from Malagasy. I am now satisfied that it is archaic Himalaic in form, and that the Himalaic affinities of the 1st and 2nd pronominal roots remarked in my first paper † on the connection between the Tibeto-Indian and the Asonesian languages, are direct and radical, and are hence to be added to the mass of the glossary, the Gangetic origin of which I have always held to be as unquestionable as that of the race.

After transferring the pronouns from the Dravirian to the Himalaic side of the account, there remains a large ingredient of Dravirian particles and substantial words in the Vindhyan dialects, and a small one in the most closely allied Himalaic dialects. The general inferences in the 1st sec. remain essentially the same, and those philologists who might have hesitated to adopt them when the Kol pronouns were considered to be Dravirian, will now find this obstacle removed.* The slight amend-

† In the section on "Tibetan and Burman," ch. IV., I remarked that in the Chino-Tibetan alliance the vocalic tendency was greater "than in the older Utraïndian languages, but that it is the result of emasculation and not an archaic trait, appears from the facts we have adverted to. The fundamental character of the S. E. Asian phonology is a highly developed articulative power, restrained within monotonic limits, but by this very restraint compelled to give the utmost variety to elementary sounds. The complex final vowels are still, to a large extent, abortive or stifled consonants, and each group contains evidence that the emasculative tendency to which the obscuration or loss of final consonants is attributable is not primitive, nor even very archaic." Mr. Edkins has since investigated the history of Chinese phonology, and his conclusions not only confirm those at which I had arrived, but have shown that the secondary evolution of tones keeps pace with the consonantal emasculation. The primitive tones appear to have been only two. About 1000 B. C. there were three, corresponding probably with the acute, grave and circumflex accents of the ancient Indo-European phonology (e. g. Sanskrit, Greek). The tones have now increased to a number varying in different parts of the empire from four to eight.

‡ "Traces of an ethnic connection between the basin of the Ganges and the Indian Archipelago before the advance of the Hindus into India" read before the Royal Society of Edinburgh in January 1851.

* The Himalaic words in the Vindhyan dialects are chiefly of the oldest southern class, Mon-Anam and Abor-Yuma. As a Himalaic vocabulary Kol ranks with the most ancient Tibeto-Utraïndian. It has specific affinities with the Mon-Anam group, with the connected Barak and Bodo-Singpho group,—with Abor,—and with some of the Nipal dialects. In the

ments required in the general statement of the position and relations of Mon-Anam, will be best made at the end of this division of our enquiry. I close may present remarks by a brief notice of the Himalaïc affinities of the Malayo-Polynesian pronouns and numerals.

The Malayo-Polynesian pronominal system is a very archaic and elaborate variety of the Himalaïc in its southern or Gangetic form. In some of its existing examples it is much richer than any of the current systems of Tibet, India or Ultraindia. Even in its roots it differs from Mon-Anam and Tibeto-Burman as these do from each other. It is not necessary, however, to recognize in it, a third great variety of Himalaïc. It appears to be simply the Mon-Anam, or old Himalaïc of the south, in a less disintegrated and corrupted form than that which it presents in the current Chinoid and Draviroid dialects of India and Ultraindia.

The most common M. P. root in the 1st pron. is *ku* or *ko*—rarely amplified to *kui*. All the archaic forms have a definitive prefix *da-*, *la-*, *na-*, *a*, the vowel being generally *a*. The pl. abs. is *ta*, and the pl. rel. *mi*, *ma*, *mo*, *mu*.

The most common root of the 2nd pron. has the forms *ko*, *kau* or *kao*, *koe* or *kue*, *ka*, *ke*; *khai* also occurs. Amplified forms are much more prevalent than in the 1st pron., and it is therefore probable that the normal form was aspirated or diphthongal. The prefix has usually the *i* vowel *di-*, *si-*, *i*-&c. *Mo*, *mu* &c. is poss. and also plural.

This system is Semito-African in the 1st pron. as well as Mon-Anam. In the 2nd it has one of the elements of the Malagasy composite pronoun, while it wholly differs from Mon-Anam, which has a labial root. Hence I felt compelled to reject the notion that it was of Mon-Anam derivation, and to adopt that of its being Malagasy and Semito-African, with a Dravirian or Draviro-Himalaïc engraftment (e. g. *mu*.) The establishment of the cumulative character of the ancient Himalaïc system, its possession of several forms of the principal and secondary roots, and the loss of some of these in disintegrated groups, enable us to reconcile the Mon-Anam with the Malayo-Polynesian. The latter preserves much of the normal form of the former. Mon-Anam and Kol have lost the pronominal root

ancient Himalaïc languages of the Gangetic basin,—Kol, Gadaba, Savara, Nipal,—there is a tendency to a dissyllabic form by vocalisation of the final consonant of the root, which appears to have been caused by the influence of the vocalic and harmonic phonology of the Dravirian dialects. e. g. Gadaba has *nir.i* *horn*, *tir.i* *ear*, *tum.o* *month*, *tsar.i* *buff-ulo*, *char.i* *iron*, *son.ai* *arrow*, *ber.ai* *red*. These final vocalic augments are generally contractions of the liquid postfix—*li*, *il*, *ni*, *in*, *nya*, *ang*.

in the 2nd pron., and retain only the fragmentary possessive (mo &c.). Malayo-Polynesian retains both the principal and the accessory roots.

The M. P. 1st pron. is identical with ku of Laos, Muthun, and Joboka, (kau Khanti.) Its early prevalence as a Himalaic form is proved by its presence in the Yuma dialects, khwa, kai, ki; in Khari, kau pl.; in Dhimal, ka, kang; in Milchanang and several of the Nipalese dialects, gu, go, ka, kag, kan; in Taying, ha; and, lastly, in the most archaic Tibetan dialect, Thochu ka. The M. P. vowel is not only that of Lau, Toung-thu, Milchanang, Lepcha, Sunwar, Vayu and some of the Kiranti dialects, but of Chinese, ngo, ngu, ngoi, gua.

The 2nd pron. is Thochu, kwa, kwe [=the Java-Polynesian koe, kue, ke]; Bhotian, khyo, khe; Limbu, khe; Kiranti, kha, ka, ha; Sunwar, gai; Vayu, gon; Gurung, ken; Lepcha, hau, [=kau Malay &c.] ha; Michanang, ki.

The most important 3d pron. of Kol and Mon-Anam, the nasal, is also Malayo-Polynesian in similar forms.

The Malagasy 1st pron. *a.hu*, *i.za.hu* &c. (poss. *ku*) is identical with the M. P. *a.ku*, *a.ko*, *a.hu*, *a.ho*, and must now be considered as of Himalaic origin through M. P., notwithstanding its Semito-African affinities. The 2nd pronoun differs from the M. P., while its African affinities are striking. It has no Himalaic or Dravido-Australian affinities. But it may possibly be hereafter resolved into a factitious or definitive compound. The new Grammar by Mr. Griffiths gives the additional forms *ia.lahy* and *i.tena*, which are simply the words for *man* and *self* with the common prefix. The principal form *hia.nao* may be a similar compound.

The Malagasy formative system is certainly a variety of the complex M. P., and as the latter must be Himalaic like the pronouns—its definitive roots being all Himalaic—it follows that Malagasy is, in all essentials, a derivative of Malayo-Polynesian, as Humboldt maintained. Mr. Crawford's hypothesis that it only borrowed a few Javanese words from Indonesia is, of course, untenable. The bulk of the vocabulary is probably Semito-African, but if the Semito-African affinities of the pronouns and formatives are not direct but merely a consequence of the ultimate relationship between that alliance and the Himalaic, Malagasy remains nearly as great a difficulty as before. Despite all the *a priori* improbabilities, we are forced to believe that, at some remote period, a M. P. colony was formed, which preserved its own linguistic system and assimilated all the native dialects, or which found the island uninhabited and was afterwards modified, physically and linguistically, by migrations or importations from Africa.

The recent numerous additions to our Himalaic vocabularies,

and the large range of variations in form and meaning which the roots are now found to possess in different groups, have greatly increased the Himalaic affinities of the M. P. vocables. Most of the Himalaic vocabularies are, unfortunately, too small to admit of a full comparison even of a single class of words in Malagasy, M. P., and Himalaic. Several of the corresponding Malagasy terms are not M. P. but African, Arabic or European, and of those which are Himalayo-Polynesian many are also African and Scythic. Nevertheless a number of the vocables common to Malagasy and M. P. can now be shown to be of Himalaic origin, and even when we reject those that are African also, several remain that are unequivocally Himalayo-Polynesian. It need hardly be repeated, that in the Himalaic vocabularies roots are found in the primary full and broad forms, as well as in curt and slender ones, e. g. *phum*, *bom*, *large*, *fat* &c. becomes, in the mouths of different tribes, *plung*, *bok*, *bot*, *bit*, *ba*, *wa*, *be*, *pe*, *bi*, *pi* &c.; so also, *snake*, *bug*, *buk*, *bing*, *bu*, *pu*, *bi*, *pi* &c.; *water*, *river*, *nam*, *nak*, *nuk*, *lang*, *rang*, *rak*, (*dak*, *tak*, *tik*), *rik*, *lik*, *riet*, *ri*, *di*, *re* &c.; *eye*, *muk*, *mok* (Ch.), *mak*, *mag*, *mig*, *mik*, *myek*, *mut*, *mot*, *mat*, *ming*, *min*, *mo*, *mi*, *me* &c.

I subjoin a few illustrations of the Himalaic origin of the Oceanic vocables, selecting, in the first place, some that are found in Malagasy.

Fire.—Oceanic.—*a.pui*, *a.pu*, *a.pi*, *a.pe*, *a.fi*, *a.hi*, &c. com.; Malagasy *a.fu*, *a.fe*

Himalaic.—*a-poi* Champhung, *pui*, *pai*, *fai* Lau; (*fo*, *ho* &c. Chinese)

Moon.—O. *bu.lan*, *bu.lang*, *bu.lak*, *wu.lana*, *ka.lan*, *a.lung*, *ata-lang*, com.; Malag. *vuiuna*

H. *pu-la*, *po-lo*, *vu-la*; *pu-lau*, *lun* Lan, *lik* Horpa (*la*, *lo*, *lu* com.)

Star.—O. *bin.tang*, *lin.tang*, *e.tak*, *pe.ta*, *pi.dua*; M. *kin.tana*, *kin.tan* (root *tang*, *tak*).

H. *lai-tan* Garo, *ka-dang*, *ka-ding* Taying, *lu-ting-ting* Tengsah, *pe-ti* Khari, *pa-tua* Ku(=pidua Tilanjang).

Sun.—O. *mata hari* &c.; M. *maso andro*; *eye of day*, a Himalaic idiom.

Day.—O. *a.rao*, *al.dao*, *alo*, *aro*, *la*, *ra*, *hari*, *ra.rak*, *la.rat*, *la.rah* &c.&c.; M. *an.drau*, *an.rau*.

H. *lai*, *lung*, *ghan*, *lang* &c.; a com. root for *light*, found in the O. form in *dau*, *lau*, *lao*, *moon*, *star*.

Sky.—O. *lang.it*, *lang.i*, *rang.i*, *rang*, *lung*; M. *lan.i.tra*, *lang.i.tsi*
The same root is found in *ma.lama*, *ma.ram*, *tu.rama*, *t.rang*, *light*, *moon* &c.

H. *sa-rang-i* Sunwar, *ta-liang* Lepcha, *p-leng* Chong; *lang*, *rang*, *h-rang*, *sh-rang* &c. *light*.

White, *Moon*.—O. *ma.sina*, *sina*, *singa*; *sun* *singa*, *sina*.

H. *chong*, *chang*, *sang*, *sing* &c. *white*; *chang*, *chi*, *tsi* &c. *moon*; *singi*, *sing*, *sung* &c. *sun*, *day* &c.

Water.—O. *danu*, *ranu*, *ran*, *ra* &c.; M. *ranu*, *rai*, *ra*.

H. *lang*, *lak*, *laung*, *dung*, *la*, *run*, *rai*, *ri* &c.

Blood.—O. *ra*, M. *ra*.

- H.** *kh-rag, kh-rang, kh-ra* &c.
- Hill.**—O. *buk.it*; M. *voh.its*.
- H.** *bum, phung, vet* &c.
- Leaf.**—O. *daun, raun, rau, lau* &c.; M. *ravina, rav*.
- H.** *lau Gurung, lha-va Dhim, da-ma Lhopa, la-ma Bhot*.
- Fruit.**—O. *buu, fua, wuang* &c.; M. *voa, vua, wuang*.
- H.** *a-bum, bo, pu, phoi* &c.
- Flower.**—O. *bung.a, fong.a* &c.; M. *vun.a* &c.
- H.** *phung, pung, bung, a-bun, won*.
- Yam.**—O. *u.bi, u.vi, go.bi, wi* &c.; M. *u.vi, o.vi*.
- H.** *bwa, ke-bei, be-rha, wi-rha, k-wei* &c. (archaic form, *buk, Lepcha*); *rha* &c. is a distinct H. root for *yam*.
- Head.**—O. *u.lu*; M. *luha, lua*.
- H.** *a-lu, lu, ru* &c.
- Hair.**—O. *bulu, fulu*; M. *vulu* &c.
- H.** *ph-run, long, ta-lu, luh.Bu, pu* is a H. and O. name for *hair*, and in the O. *bu.lu* both elements may be radical (=hair of head).
- Eye.**—O. *mata, mato* &c.; M. *maso*.
- H.** *mak, mat* &c. com; *mat-ta Shan*.
- Ear.** (1) O. *ta.linga, lew.lina*, nine &c.; M. *ta.linhe*.
- H.** *te-lanu, te-naung* &c.
- (2) O. *su.ping, chu.ping, ku.ping, a. pang*; M. *so.fina*.
- H.** *ri-pang, ru-pung, nai-pung, bil*.
- Mouth.** (1) O. *ba.ba, fa.fa, pang, pa* &c.; M. *va-va, va-ve*.
- H.** *pang, bang, pan* &c.
- (2) O. *mulu.t*; M. *molo.tra, mulu (lips)*.
- H.** *mur, mura, mor* &c.
- Teeth.**—O. (a) *ni.pun, ni.fan, ngi.fan, ni.fo*; M. *ni.fi*.
- (b) *ngi.ngi, gi.gi, ni.ni* &c.
- H.** (a) *bung, i-pang, fan, phu, pha*.
- (b) *ngi-lo, ngeok, niat* &c.; Chin. *nga, nai*.
- Check.**—O. *pang, ping, pa.pa, pi.pi, si.pi, sa.pit* &c.; M. *fi.fi*.
- H.** *ban, bo, pa, beng, si-bi, bi-ya*.
- Tongue.**—O. *li.la, a-le.lo, li.da* &c.; M. *li.la, le.la*.
- H.** *a-lang, luoi, lin, li, a-li, le* &c.
- Nose.**—O. *i.goug, u.gong, u.rung, i.dong* &c.; M. *u.rong*.
- H.** *gung, kung*.
- Hand, Arm.**—O. *langu, linga, ringa, lima*; M. *lima*.
- H.** *lag, lango, &c*.
- Bone.**—O. *tu.lang, ba.long, ba.lu, loh, riu*; M. *tu.lana, &c*.
- H.** *ku-lung, k-lan, ku-nang, ma-ru* &c.
- Horn.**—O. *tan.duk, ta.nok* &c.; M. *tan.droka*.
- H.** *duk, ka-duk, nuk, ta-ru* &c.
- Man.**—O. *o.rang, o.rana, laning* &c.; M. *o.lona, u.lu*.
- H.** *k-lang, lan, p-ra, ka-ruc*.
- Bird.**—O. *bu.rong* &c.; M. *vo.rona*.
- H.** *bu, wu* &c. root; —rong, ring, &c. minor postfix, as in *du-b-ring, bird, Garo*; sig-rong, mosquito, Singpho.
- Black.**—O. *ma-i-tam, ma-i-tum, mo-i.to, itam* &c.; M. *ma-in.ty m-in.tin*.
- H.** *dam, shim, ti* &c.
- White.**—O. *puti, ma.busi* &c.; M. *ma.futsy*.
- H.** *gu-phut, phuk, buk* &c.

- Red*.—O. mera; M. mena
H. mar.am, mri, mar, ber.ai &c.
Green.—O. i.jam, i.jong, i.jo, i.jau; M. ma.i.tso.
H. cham, chang, jang, chim, tsing, &c,
Good.—O. sari.n, hare, sang, (sara *very*); M.tsara.
H. tsar, san, &c.
Hot.—O. pana.s, ma.fana &c.; M. ma-fana; vange, *fire*, Pagai.
H. van, ban &c. *fire*.
O. maiang, na.pai; M. mai
H. mai, pai.
Ripe.—O. ma.sak, ta.sak, ang.sa; M. ma.saka.
H. suk, song, a.ta &c.; (Chinese shuk, sok.)
Raw.—O. man.tak, man.ta, ma.tak; M. man.ta.
H. ma-tók.
Sweet.—O. lim; ma.lem.y, ma.lam
H. lem ho, lim.ha, lem.a, ke.lim.ba.
Sour.—O. ma.sam, a.sam, a.sim; M. ma.si.
H. som, ta-san, a-sin, a-si &c.
Salt.—O. ma.sima, ma.sina, a.sin, ma.sik, ma.si, pena.sim, sira; M. funa-sina, sira.
H. sum, sung, ma-tsu, ha-sam, ma-tsi, ba-si; Ugrian sir, sol.ni &c.
Large.—O. i.bi, e.be.yo, o.bo &c.; M. be, bai.
H. ta-pe, gu-ba, vu; a-vai broad.
Fat.—O. nu.tam.buk, tam.bun, ma.ta.ba; M. ma.ta.vy.
H. bom, ta.bok, ta.bit, pan, wa, phi, pi &c., ga-phung.
- In the subjoined examples, in which Malagasy is disregarded, I have italicised the M. P. prefixes and affixes, indicating the concreated ones by a dot and the current ones by a hyphen.
- Black*.—(1) O. lom.lom, ha.lum, ma.rum, bi.lum, ma.lau, ri.ram, li.ling, joa.loa, hi.rang, i.rang, chi.lang, chi.lum, mo.rim, bu.ri, na-vu.ri, u.li; i.loko, laka, ba.luga, mo-e.log, lotong; *Night*, k.lam, ho.lam, ga.ran, ga.gam (g for r), mu.lum, ma.lam, a.lam, ma.lim, ma.lang, na.rom, sa.na.run, nga.ru, da.lum, da.lu, Malag. ha.lem, ha.len, a.lina (the root for black); *Dark*, g.lap.
H. m-long-ya, m-lang-ai, pa-leng, rok, cognate with the more com. nag, nak, &c., both forms occurring in derivatives, e. g. *crow* long, lak, lok, rak, nyag &c.; (Chinese, lam, *blue*; the H. names for black, signify also *blue* in several vocabularies).
(2) O. pang.u, manga, panu, na-bonge; *Night*, bung, bong, pung, bungi, wungi, wengi, bengi, bangi, bongi-na, na-bungi-mo, de-bingi, uni, ni-bo; ka.put, im.bot; *Fog*, ka.but; *Black*, ma.puchu, ka-muso, poto, buta-ra; *Blind*, buta.
H. a-vum; *Blue*, vom, mon; *Dark*, a-mum, a-mok, mui-da; *Night*, mon, mor, a-van, rang-pan (*sky dark*).
White.—O. bu.rak, raka.raka, bu.dak, fu.lak, bu.ran, na-bu.la, ma-bu.lau; comp. *Moon*, bu.lak, bu.lang, bu.lan &c.
H. a-lum, kan-lum, ka-p-rom, kam-ph-long, ph.ru, k-lang, lak, bok-lang (two roots); See *Moon*.
White.—O. ka.bok, sa.bok, to.poku, ta.vake, sa.va-sa.va.
H. bok, buk, bak, bo, po, wa, gu-phut.
Day.—(1) O. bu.chu, a.so, u.sa, a.ho, a.o, a.hi, a.s.
H. ma-sung, a-sun; *Air*, na-su, &c.

- (2) O. *o.nong*, *o.nu*, *a.no*, *ngu*, *ngo*, *nga*; *Sun*, *mata-n o.nong*, *tamu a.num*, *matu-n a.nui*, *mata no.nu*, *ne.no*, *a.no* &c.
H. *nyin-mo*, *ta-na*, *ta-ni* &c.; Anam ngai, Kamboj. *ta-ngai*; *Sun nga*, *na*.
- Fire*—O. *met-us*, *mido-us*, *us* (Simang, Jakun), *moi Masid* (prob. from *a.poi*).
H. *ka-mot*, *ta-mot*, &c. Mon.
- Water, River*—O. *sa.bug*, *tu.big*, *buhi*, *wig.weh*; *u.mo*; *o.bait*, *o.ba* N. Aust.; *wai*, *vai*, *a.wi*, *ba*, *pa*, *we* &c.; Malag. *ba*; *bitu*, *pitu*.
H. *buk-bi*, *river*, Mon; *mok*, *mak*, *water*, Nicobar; *muk-sung*, *river*, Bhot.; *a.m*, *u.m*, *ba*, *wa*, *pi* &c., *water*.
- Water*—O. *tat*, *tai*, *a.ta*, *ka.tao*, *dau*, *dho*, *do*.
H. *tak*, *dat*, *dak*, *dai*, *toi*, *doi* &c.
- Earth*—O. *ta.no*, *tu.nu*, *ta.na*; Malag. *ta.ne*; *rai*, *rau*, *dae*, *ru.run*.
H. *nyai*, *noi*, *ni*, (nai Chin); *ta-lai*, *ta-ri* &c.
O. *i.ri* Utanata (New G.).
H. *th-li*, *ta-ri* Khyeng, *m-re* Burm. &c.
- Mountain*—(1) O. *gu.nong*.
H. *non*, *pi-nong*, *dong*, *kh-lung*, *rong*, &c.
(2) O. *buk.it*.
H. *bum*, *phung*, *vet* &c. (=large). See *Large*, *Fat*.
- Man*—(1) O. *laki*, *la-la.ki* &c.
H. *lang*, *lago* &c.
(2) O. *ma.chua* Niha.
H. *me-sung*, *chul*, *chho*, *chong* &c.
(4) O. *touk*, *tauo*, *tau*, *tavu*, *dho* &c.
H. *duk*, *thuk*, *tho*, *sau*, &c.
- Woman*—(1) O. *bi.ni*, *ba-bi.ni*, *mo.be ni*, *ma.be*, *bai*, *bei*, *ba.bai*, *be*, *ma.be*, *we*, *sa.wei*, *wei*.
H. *mul*, *ma*, *mia*, *mi*, *bi* &c.;
na, *ne*, *ing* &c. is a fem. root.
(2) O. *be.ti.na*. Prob. *be.ti.na*.
H. see (1).
(3) O. *ma.lau*
H. *p.lau*, *p-riau*.
- Father*—(1.) O. *a.pang*, *a.mang*, *a.mbo*, *am.bi*, *a.ma*, *a.me*, *a.mai*, *i-ma*, *e.me*, *ka.ma*, *ta.ma*, *da.ma*, *sa.ma*, *je.ma*, *ti.ba*, *wa*
H. *u-pa*, *ta-ba*, *a-ba*, *i-pa*, *na-ba*, *ke-pai*, *a-mbe*, (*mi*, *ku-mi*, *sa-ma*, *cha-mai*, *ma* &c. *man*).
(2) O. *kan*, *i.kan*, *u.kin*, *ma-kua*
H. *a-gu*, *kea*, (*u-ku* paternal uncle)
- Mother*—(1) O. *i.nang*, *i.na*, *ti.na*, *ji.na*, *se.na*, *si.ndo*, *re.na* *i.ndu*, *i.ndong*, *i.nei*, *a.nu*, *i.nu*, *nai*, *i.na.na*, *no.no*
H. *num*, *nung*, *naoi*, *a-ne*, *a-nu*, *ka-nu*, *na.na*, *nu.nu*, *ing-yong*; *nang*, *woman*, Siam.
(2) O. *bok*, *a.po'*, *i.bu*, *am.bui*, *mui*, *weh*
H. *a-vu*, *a-phu*, *i-pe*, *ta-mo*, (*a-pok*, *po*, *bu*, *i-pho* &c. *father*)
- Child*—(1) O. *a.nak*, *ka.nak* &c.
H. *luk*, *lom*, *lon*: *ka-na*, *he-na*, *a-no*, *a-nai*, *pa-no*. A com. root for *small*, *fruit* &c., used as the minor postf. (*fruit*, *leaf* is *tree's child* in H., *ear* is also *child* i.e. *body's* or *head's child*, so also *tooth*, *nose*, *hand*)
(2) O *ke-i-ki*, *a-tai*, *a-ti*-See *Small* (2)

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Hog—O. *a* ba.bai, ba.boi, ba.wei, ba.bi, wa.wi, va.vi, boi &c.; *ka*.pot, *ti*.bong, buga, buga.s, baka.s, puaka.

H. phag, pha, wak, vak, wah, bak, bai, bo, po, vo, pi &c.

Dog—(1) O. *ka*.so, *ki*.song, *ba*.song, *bu*.sa, *hi*.ching, *an*.tsing, *an*.jing, *a*.su, *a*.so, *a*.cho, cho.

H. *ta*-su, su, ku-chung, ku-chu, cho.

(2) O. *a*.pang, *a*.bu, wau, wo, *o*.ma, *u*.mai.

H. *a*-vai, phu, wi, ma &c.

(3) O. *ko*ih, *o*.gai, kua, *koyo*, *koya*.

H. *ka*oi, uyo, khwa, khui, kai, khu, ku, koe.

Goat—O. *ka*m.bing, *ka*.bim, bi, bi.mi, bi.bi, be.be, bem.be, im.be, be.

H. *ka*-mi, *khu*-bai, *hi*-bi, *ha*-meng, me, mi, pe, be, *na*-bung, po.pe &c.

Cat—O. *ku*.ching, *u*.ching, sing, *an*.ching.

H. *mo*-chi &c. (*dog* ku-chung, *chi*-ma &c.)

Cow—(1) O. *lim*.bu.

H. long, *k*-lo; ba-lang, bo, wo, po.

Comp. lung-bu, lang-bo, *elephant*.

(2) O. *sa*.pi, *sa*.pi.

H. *sa*-muk, *ye*-pi, pi-a, bi, pit, bik (*sa*-wet *buffaloe*, *sa*-puk *horse*, *sa*-loi *buffaloe*).

bik, bi, pi, is a H. root for *cow* &c., but *sa*, *sai* &c., although com. as a prefix, is also a root for large quadrupeds, and pi is a form of the major postfix, comp. *sai*-pi, *elephant*, Kuki. The O. vocable may thus be *sa*-pi.

Buffaloe—O. *ka*.r.bau, *ka*.ra.bao, *ka*.ra.bui, *hi*.bo, *ka*.ba.

H. *k*-ra-bo, *kh*-rui, *k*-ro.

Elephant—O. *be*.ram, *b*.rang.ke, *b*.ring.kil.

H. *ti*-rang, *tum*-rai, ra; Comp. *b*-rung, *buffaloe*, *m*-rang, *horse*.

Horse—O. *ja*.ran, *char*.an, *ja*.rang, *ja*.ram.

H. *se*-rang, *sa*-dam, *sa*-la; rang, rung, ro, ri &c. is also used by itself and with the guttural and labial prefixes.

Tiger—O. *ma*.chang, *ma*.chan, *ma*.sangi.

H. *ma*-cha, *ma*-sa &c.

Monkey—O. *k*.ra, *b*.rok.

H. *k*-lak, *mo*-kha.ra, *p*-ra.

Fish—(1) O. *i*.kan, *i*.ka

H. *ka*.

(2) O. *e*-ngo Sunda.

H. *e*-ngo Abor.

(3) O. *a*.san, *i*.sa'.

H. *i*-zha Thochu.

(4) O. *i*.bang, *i*.bah, *a*.mon, bau, bei, bo, wa.pi.

H. *moi*, wa, pau.

Snake—(1) O. *u*.lak, *u*.lar, *u*.la.

H. *phu*-rul, *t*-ran &c.

(2) O. *lam*.bun, bio.

H. *ta*-bug, bong, bi &c.

Bird—(1) O. *ma*.nuk, *ma*.nok, *pa*-pa.nok

H. *nuk*.

(2) O. *pio*, ban, pao, *i*.bu; *fowl* moa.

H. *pia*, *pea*, moa, bu.

(3) O. *janga*.

H. *jhang*o.

(4) O. chim.

H. chim, sin.

Large.—(1) O. lum.po, le.va, le.be, lo.a, u.li, e.li.p &c.—*Broad*, ma.lam.ba, ram.ba, b.rang, bu.ra; pa.la.wa, la.fa, lam.bang, lo.vang, le.bar, ro.ba, ma.lo.a, lu.was. *Thick*, ma.lu.a, mo.li.pu. *Many*, mo.la.bang, ma.ra.mo, ma.ra.mi, la.mon, lo.ba', li.ba, le.we, lui, lo.a.ru, liu, ar.ra. *More* lä.bih, ka.li.wat. With le.bar &c. *broad*, comp. tä.bal, ti.bar, ki.pal, ka.pal, mag.pal, ma-um.pa, um, ban, ma.pa, pa, pu &c, *thick*. Probably lam.bang, lo.vang, le.bar, lu.was &c. contain 2 roots or a pref. and a root.

II. Rang, la &c. See (2). Bal, bar, vang, was, be &c. corresponds with bak, be &c.(4), H. bom, bok, be.

(2) O. gā.dang, gi.de. ke.dui, tui, teu, na.be tike, na.be tik.

H. ma. rang Kol, leng, len, dong, do, tom, tim, u.tok, tak, tek, dok-pu, to-tuk, ka-tai, ge. det, go-da; Ch. tua, tai, ta; Much duk-lo, o-to. Turkish u-lug, ba-duk *large*.

(3) O. be.sar, ma.sela. See (4)

(4) O. bo.bak, a.pa.pa.ki, na-bo, na-ba, na-be, na-pe, o-bo, i-bi, pu, am-boi-da, be, bui &c. *Broad*, am.bang, i.bang, mā.i.ba, buē. *Many*, am.buto, vutuh, busu, i.wata, badi, bete, bui. bete, besui.

H. bom, bok, ba, be, &c. *Broad*, pha'a, tah-pet, tu.be.

(5) O. a.gung, u.ki, o.ko.

H. koi, kuok, kyi, ki.

High.—(1) O. a.tas, i.tat, re.tat, tato, a.tai, tei.tei; thake Viti; (a.tas, above, Malay &c.)

II. data Silong, a-dag Miri. *Above* tu-thak, a-thuk, a-tan, a.tong, tol &c. Turkish a.dis.

(2) O. ting.gi, tike, i.ke.

Ch.kou, ko, kui &c.

(3) O. ma.juh, ma.juu. *Far* jau &c.

H. a-chuung, sung.

(4) O. le.va, la.ma, ma.la.nga. *Deep*, da.lam, ma.lamo, ro.lang, luang, p.rang, See *Large* (1)

H. lang, ta.lang, la-ba. See *Large* (1)

Long.—(1) O. pan.jang, lang.chang, kan.jang, ti.jang

H. a.shang-ba, a-sai, ka-cha. *High* u.shang-e, ri shang, song, suk, su, sa. Ch. ch'hiang, ch'hong

(2) O. lan.jut, mu.langut, ma.laka, ma.lati, ma.las, ma.rawas, loa, lu, loa, la.bu, la.bug, li.mu, da.wo.

H. lang, ta.lang, ka-lein, ka-long, a-lhok; la-mo, rim-bu, a.lo, lau, lou, bi-loi, be-lo.

(3) O. bin.to', na.dati, hi.dak, a.taha, ma.taha.

H. a.dat Silong. See *High* (1)

Small, Little.—(1) O. ka.chil, ka.chi, chi, ba.chut, pa.chik, pa.chig, sig, bu.sit,

H. ch'hang, chuk-pa, u-chu, chum-ba, ka-chu, a.chim, ka.chai, a-cha, i-cha, i-shi, e-ching, ka-chi, ka-tsi, a-chi, chig, me-chhuk. Turkish, ka.chik, ki.chik, ky.chuk.

(2) O. ka.liko, liki, ko.rek, ke.lik, ke.li, a.let, lati, ba.li', be.lak, mo.roiti, (a.roit, N.Aust), wa.re.rat, kabi-luki, ka.ni, man.diki, mo.di, diko, ku-di', diki, dekal, dik.tai, u.di, da.ti', c.te', i.ti', o.to.tak. na-iki (=diki), a.na-ka, iki, iti, utu, ete, ba.di, mun.ti, mc.mc-ti, a.mo-k, o.k, u.ki

- H. lek, let Lau (*Child* luk), a-ring Nams.
- Few*.—(1) O. *sa.diki.t, ma.diki, su.riti, kan.iki, ka.ni, deki, itak, dit, iti, iki, ok, wa.ti-ti, tio.tio, &c.* See *Small* (2)
- (2) O. *mon.chot, sin.cho, ba.chute, juti, hudi, ba.set, tsuto, chuch, u.si &c.* See *Small* (1)
- Short*.—(1) O. *pan.dak, pon.dok, pen.dek, ma-pun.di', bun.ta', nam-pu.du, ma-pu.ru, ka.te, a.duko, tuk, po.to, po.nok.*
- H. *ban-dok, to.toko, pok.tok, dok, tak-sye, thung, thum, tun, dung deng, tot, tut, ta-tsu, sa, a.toio, to, tu, do.*
- (2) O. *mea.put,*
H. *phu.*
- Straight*.—(1) *tonu, to.tonu, to.to, tian, ð.tul.*
H. *ton.do, son, thong, chang, cheng, jong-pa, tau, to.*
(2) O. *no.lor, lurus, nar, lua.*
H. *lung, loung, lo, na.*
(3) O. *tika*
H. *theka* (M. Ang.), *tuk Mon, tuk.va Gond, thung, tung, thang, tang, ting, chang, jong.*
(4) O. *kān.chang*
H. *chang &c.* (2)
- Crooked*.—(1) O. *beng.kok, meng.gok, leng.kok, leng.kong*
H. *kak-po, kok lok, ko lak, kok ta, kok teng, ta-ko, kauk, kot.* Comp. the Nipal, Vindhyan and Drav. *banka, banko, bengko, banga Newar benko, bang go, byang-kruk, wang kang &c.*
- (2) O. *bu.lok.tot, bu.liku, mi.lok, leko*
H. *lok.*
- Round*.—(1) O. *bu.lat, bu.lah, a-bo.la, bo.leng, pa.ling, pu.long, po.ro, ma-bi.log, ta-bu.nak, u.lam, a.la, ra.ru'*
H. *pu-lu, pu-lun, x-lum-po, lung, bup-luug.ma.lun, ri.ri, re.r, ri.l*
(2) O. *bu.bu, poi.poi.*
H. *bur.bur, bop, pu.pul*
(3) O. *ti.buk, lim.bung, ma-li.bu.* The root is applied also to round objects. *buku a grain, joints.*
H. *kala-bok.bok, puk.puk-na, puk-luk.luk*
- Eat*.—(1) O. *ma.ngan, fa.nga, ma.kan, nga.kan, kana, kan, ka, kai, ngu.ngu, a.ngu, me.nam.*
H. *nangi* (Horpa), *nga.jeu* (Manyak), *ang, an An., khai, ga-ba &c.*
(2) O. *a.san, cha.cha.*
H. *sa, cha, tha, so, cha.chau &c.*
- Drink*.—(1) O. *mi.num, ngi.num, i.num, i.nu, mag-i.num, mak-i.nu.*
H. *noi, u-nah, ona, nei, nue, tu.num; uong, nhau An.*
(2) O. *tonu, tinu* (? 1)
H. *ton, thung, thu nu, tu.num*
- Sleep*.—O. *ti.dor, tu.dung, tu.do, tu.d, tu.ru, a-tu.li.*
H. *du.rong* Kol, non Siam.
- Weep*.—(1) O. *tu.ngis, men-a.ngis, na.ngi, ta.ngi, tu.ma.ngi, sa.nget.*
H. *ngu, ng-ak, ngo, (? tang-is=dang H.)*
(2) O. *me.wang, ni.wang, wai.*
H. *a-wu.*
- Speak*.—(1) O. *tu.tur.*
H. *tho-i, tal.*
(2) O. *u.chap, i.choh, i.si, pang-u.sap, sapi, sabi, sopa.*
H. *shang, che-na*

- (3) O. *ta.gor, ti.ko, ti.kon, ta.kan, ta.kuna*
H. *kwor, kur* (Thochu), *kah &c.*
- (4) O. *am.pong, fiang, boa, man-i.bu*
H. *ba-h, pa-re*
- (5) O. *i.war, mir*
H. *wan*
- Be silent, Silence*—O. (1) *diam.*
Ch. *tiām. H. shum, chum*
- Laugh*—(1) O. *ke.kek, mu-ki.ki, ye.ka, o.ku, a.ka-a-ka, i.k.*
H. *kha khe Horpa, [kakku-mu Kondh], kuoi An., kho Siam.*
- (2) O. *gā.lak, ki.lap, la.lang, na-ke.re, na-ge.le, go.lo, mang-i.ri, ma.ri, ma.li.*
H. *ma.nit, ni, ye-re, re-t, ri sa, ri-ya, da.ran* (Thochu), *na-ri-r* (Manyak), *na.re* (Gyar.)
- Walk*—(1) O. *ja.lan, da.lan, da.lam, a.lam, la.la, lo.lao,*
H. *di-lang, la, lin lat.*
- Run*—(1) O. *lari, lele.*
H. *lora, lir, lei, ni, ri, dur.*
- (2) O. *p.luang.*
H. *p.lok, lok.*
- (3) O. *la.jang, li.jong, lu.jong.*
H. *chong.*
- Give*—(1) O. *dao.*
H. *i-rao An., da.*
- (2) O. *tuu, tu, a-tu*
H. *thong.*
- (3) O. *ngeni, nein, uni, nao.*
H. *nang.*
- (4) O. *e.ka, kau.*
H. *ko, ya-khu, ya-kai.*
- Take*—(1) O. *a.rap, la.ve, a.la.mi, a.lao, a.lou.*
H. *lan, lau, la, loh, ling, la-pu, le.*
- (2) O. *tang.kap.*
H. *kap.*
- (3) O. *u-ka, i-ka, ka-u.ta.*
H. *ka.* See 2.
- (4) O. *chuko, siko, jakit.*
H. *chiok ko, si.*
- Sit*—(1) O. *du.duk, teka.teka.*
H. *du.g, do'.*
- (2) O. *man-jong, i-juku.*
H. *shong, jo.*
- Bring*—M. *bawa mari* (convey come)
H. *ba give, Bhot. &c., wa come* Newar. In H. *give* is *give-come.*
- Take away*—*bawa pirgi* (convey go)
The H. idiom is *give go*
- Bring*—(1) O. *im-bet, wet kase, bīto, witia, batu.*
H. *a.witea, budi, pit.*
- (2) O. *a.kua, i.kan, kau, te.kau, ti.ki*
H. *h-khyon, s-kyeh.*
- Stand*—*tigga, tagi, taki, tika, tengga.*
H. *dag, ding &c.*

The affinities of the M. P. numeral system with the Semito-African, Scythic and Indo-European are much more obvious than those with either the Tibeto-Burman, the Mon-Anam or the Dravirian. But as it can no longer be considered as of Africo-Malagasy origin, the only alternative is the conclusion that in this, as in other cases, the complex relationship arises from the Himalayo-Polynesian and the Semito-African having carried, on their separate routes to the S. W. and S. E., roots and forms prevalent in the proto-Scythoid languages of Mid Asia. A glance at the M. P. series of names shows how largely and almost completely it differs from the Chinese, Tibeto-Burman, Mon-Anam and Dravirian.

1 i.sa, a.sa, sa, sa.ra &c.

6 a.nam, nam, num, o.no &c.

i.ta, ta, ta.si &c.

7 pi.tu &c.

2 du.wa, a.du.a, ru wa &c.

8 wa.lu, wa.ru, ba.lu &c.

3 to.lu, ti.lu &c.

9 si.wa, si.ba, si.pa &c.

4 am.pat, a.pat, an.far &c.

10 pu.lu &c.

5 lima &c.

This system differs from the Mon-Anam not only in roots but in method. It is apparently decimal, while Mon-Anam is quinary. Nevertheless it appears to be Himalaic. A quinary system is preserved in Asonesia, and it is evidently older than the prevalent M. P. In the dialects in which it is found, both the lower M. P. and some other roots occur. If the M. P. can be explained as a purely Himalaic system, it must be through the older Papuanesian dialects, which often retain Himalaic roots in greater purity than those insular languages that have come under the full influence of the vocalic M. P.

A quinary system is still found in different parts of Asonesia. It prevails in several of the Papuanesian groups of dialects, and examples of it are also found among the least civilised tribes of Indonesia. Even in its western extremity, Telanjang is partially quinary. From the distribution of the quinary systems and the manner in which they have been encroached on by the decimal, it would appear that they were characteristic of the old Papuanesian civilisation, and were widely distributed along with it before the Malayo-Polynesian decimal system, in its current form, was carried from Sumatra eastward. The numeral elements in these quinary systems are all Malayo-Polynesian. The unit varies considerably, but, in every case, it is either still found in some of the decimal systems also, or it is a M. P. definitive, like all the existing M. P. units. The extent to which the unit varies in the insular systems shows that in their earlier, freer and richer stage, all the definitives entered into them, either as roots or adjuncts.

As examples of the quinary systems we may take the West New Guinea and the New Caledonian groups, both Papuan. The known dialects of the former use for :—

1. sai, *wo-sio*;
tu, *ko-ti-m*, (*ti-vi* in 6), *ke-teh*, *di-k*, *ta.ta* ;
o-ser, *jo-ser*, *siri*, *ko-iri*, *ko-rii*, *do-iri*, *me-le*, *te-ne* (in 6), *a-ne* (for 6,
in 7, 8, 9), *nai*, *wo-am* (= *wo-un*, *e-an*);
re-be.

2. *ru-ru-o*, *bo-ru*, *bo-r* (in 7), *nu.wa*, *ru.e.ti*, *ro-ti*, *ru-si*, *koi-ru*, *ru.ru*,
nu.ru, *su.ru* ;
re-du, *mon-do*, *dui*, *re-di-s*, (*ro.mo-di-di*, Ternate), *a-li*, *ko-ri-si*, *ki-r* ;
yan.

3. *tolo*, *toro*, *tori*, *taru-si*, *toru*, *todu*, *e-tiro-m*, *oro*, *wo-ro*, *kori-si*,
kior, *gri*, *kar*, *ngu-kor*. Comp. the guttural for *t* in *a-kulu* Telanjang, *kolu*
Pol., *wo-kel* Kissa (*wo-a-ka* 4 = *wo-a.ta*, Letti, *wo-i-ko* 7 = *wo-i.tu* Letti),
glu Tob (= *tlu Buton* &c.)

4. *fak*, *fiak*, *fiet*, *ak-a*, *wo-ak-o*, *at-i*, *at-o*, *at*, *at-e-si*, *e-at*, *bo-at*, *bo-ah*,
re-a, *t-ar*, *mo-a-no*.

5. *rima*, *rino*, *rimbi*, *imbe*, *ebe*, *rim*, *lim*, *di*, (*in-di-a* in 8), 9 *mi-k* [from
limi, *rimi*] ;

ma-ti-si (= *ko-ti-m*, 1) ;

ma-ra-si, *b-rai-a-re*, *me-r* [= *me-le*, *ri*, *nai* &c. 1] ;

ma-swar [= *sara* 1] ;

buk, *ma-fuk* (also *ma-f*), *wong*, *ong*, *onè*.

6. is 5.1, or 1, but the unit sometimes differs from the current 1. *Tandia* *ma-ra-si-inje* 6, *nai* 1 ; *Arfak* *ka-swar* 6, *woam* 1 ; *Karon* *di-k* 1, *ma-k* 6.

7. is 5.2, or 2. The *Arfak* *ka-siar* is not *yan* 2, but probably *suru* &c. 2, of other dialects. One dialect has *a-ne-me-le* = 6. 1, the 8 and 9 being also 6.2 and 6.3. *Oniu* has *tara-sa* 7, *tara-nuwa* 8.

8 is 5.3, or 3. The M. P. *waro*, *war*, is found in a few dialects.

9 is 5.4, or the M. P. *siwo*, *i-siu*, *siew*, *si*.

10 is 5.2 (2d 5, 2 hands) ; 5 and 5 ; or, by contraction, 2. Hence it agrees with, or resembles, 7. *Yower* *re-du* 2, *b-rai-a-re* 5 (= *nai* 1 of *Tandia*), *b-rai-a-re-du* 7, 10 ; *Omar* *ko-ti-m* 1, *re-di-s* 2 *ma-ti-si* 5 = (*ti*) 1, *ma-ti-si-re-di-s* 7, *ma-p-ti-di-s* 10.

In most of the dialects 10 is differentiated from 7 by the use of a distinct name for 5 or 2. *Wandamin* has *rim-ma-mon-do* 7 (*mon-do* 2), but in 10, *rim-ma-surat* ; *Irasam* has *buki-ru-si* 10, but in 7 (as in 5, 6, 8 and 9) it uses the current M. P. 5, *rima-ru-si* r *Amberbeki*, in like manner, has *imbe-ki-r* 5, but *ong-i-r* 10 (*wong-i-r-ki-r* 20).

The labial 5, *ma-fuk* (in Ternate and Tidore *tu-fu*, *to-f*, *to-ha*, *ta-ha*, *to-m*, in Dayak *si-mong*, *so-mong*), is repeated in 10, *ma-p-ti-di-s* (*ma-p-ti*, 5, 1, *di-s* 2), *buki-ru-si* (5, 2), *ong-ir* (5, 2), *onè* (also in 9, 8, 7), and 20, *wong-i-r-ki-r*. It is probably a unit, *sam-buk* Bisayan, *su-pu'* Sasak, *Sambawa*, *sa-buting* Banjar.

10 has the form *pusua* in *Onin*, *puti* in 9 (*sa-puti* 1. 10) and in 20, 30 &c ; *wutsya* in *Lobo* (= *wutus*, comp. *ratsya* 100 = *ratus*) *won*tractions are found in the *Gebe* *ut-i* 10, *Tandia* *ut-in* 20, *Moo*. *na-utah* 20, *Ron* *arz-us* 20, *Ron*, *Mefaor* and *Ansus* *ot-in* 100 (also *Salawati*) ; *Rodscar* Bay *wa-uta*, *Louisiade* *wa.ta* 10. This form is found in other groups, 10 *putu* Pagai, *mo-put* *Totong* (Borneo),

wut Keh, utsya, putu-sa Ceram, utu, ut, u in 20, 30, 40, 50 &c. pu.i.t 6 (1 for 5, 1) Simang; in some Borneon dialects it is found in 9, so-pa.t, su-pi, pi.t-an (=sa-pu.ti Onin). It appears to be the dental unit with the labial pref., comp. Bisayan *u-sa* 1. The form *su* is found in 1 of Sasak, Sandol, Banjar, and *tu* in 1 of Aru. Timor has *woes*, *boes*, *boesa* 10, i. e. the common *e-sa* 1, with *wu*, *bc*, pref. (the current 1 is *me-si*, *me-sa*). Comp. the Lobo double *sa-mo-si*, the Aropin *wo-si-o* 1, and the Redscar B. *ow-ta* 1 (*ow-ta-mo-na-ow-sa* 9.) Yengin (New Col.) has *we-ts*, *he-ts*, 10 and 100. The bui of Mille 1, Tarawa 10 in a-bui 40 &c. appears to be a contraction of the western *bu-si* or *bo-e-si* 1, 10, like the Ternate, *ri-mo.i* 1 (*ro-mo-di-di* 2).

A guttural 10 is preserved in sam-ku 20 Irisam (*sam-ku-ko*, *kara*), and se-ku-mat in 20, 30 &c. Lobo. Comp. 10 *ma-koth*, uk ok Pulu, se-ga, se-k &c. Carolines, Tobu. This is 1 of other dialects, si-kei, su-k, ti-ka, sa-ku.

Onin has some exceptional names. 7 is *tara-sa* (*sa* 1), and 8 *tara-nu.wa* (*nu.wa* 2). Here *tara* has the function of a ne in 7, 8, and 9 of the un-named dialect. It is found also in the Redscar Bay dialect *ow-tara-toi* or *towra-toi* 6, *ow-tara hani* or *towra-hani* 8, *a-dara-ta* 10. As *toi* is 3 and *hani* 4, *tara* signifies either *second* or *again*. In 10 *ta*, 1 must have been proposed to *five* or *hand*. In the Irisam 20, *sam-ku-ko-kara*, *kara* has the same power, and appears to be the same root. It is the Philippine *kara*, e. g. *kara* today 11, *kara dua* 12. In the Moor 10. *rimo-taurah*, *taurah* appears to be the Redscar B. form *towra*, Brumer I. *saoru*. Pomi has the contracted form *awrah*. The surat of Serui and Wandamin is probably a similar repetitive name. The Ende *tara-sa* 9=Onin *tara-sa* 7.

It will be observed that while in some of these dialects 5 is the common M. P. *lima*, *rima*, *dima*, *nima*, *dimi* &c. or a contraction of it, in others it is a unit, and not always the current 1 of the dialects. *Lima* is *hand*, and the full form was *one-hand*. A connection is disclosed between 2 and 3. Thus Dasenar has *su-ru* 2, *to-ru* 3, and the Tandia 7 (2 for 5.2) and 8 (3 for 5.3) have *sa-ru-si* and *to-ru-si*. In like manner Formosan has *pe.roa* 2, *to.roa* 3. Probably 3 was originally 1.2 (to 1, *ru*, *roa* &c 2).

In the New Caledonian group we find for:—

1 not only *sa*, *ta*, *ts*, but *kew* and *wa-nai*.

2 *wa-ru*, *ba-ru*, *po-lu*, *pe-ru-ri*, *he-luk*,—and *bo*, evidently the prefix without the root.

3 *pe-ni-ri*, *pe-ni*; *be-ti*, *ba-ti*; *wa-tyen*, *tye*.

4 *wa-bai*, *kana-fui*, *po-bits*, *pe-u*, *be-u*.

5 *wa-nim*, *i-nim*, *nim*, *kana-ninu*; *tangake*, *tanganga-ri*; also *ta.hue*, a unit.

6 is either *my.1*, *keu*, *sa*, *ta*; or 5.1 *nim-we-t* (= *he-ts*), *no-ta* (no as

in 7, 8, 9, from nom 5, now superseded by tanganga, tangake (*hand*), *wa-nim-i* (for *wa-nim-nai*).

7 is 2, *ba-ru*, *po-lu*, *a-lu*; or 5.2, *wa-nim-ru*, *nim-we-luk*, *no-bo* &c.

8 is 3, *tye*, *ba-ti*, *pe-ni*; or 5.3, *wa-nim-yen*, *no-be-ti* &c.

9 is 4, *va*, *pe-u* &c.; or 5.4, *wa-nim-bai*, *no-be-u* &c.

10 is 5, *i-nim*, *kana-ninu* &c.; 5.2, *pa-in-duk* [= *pa-nim-luk*]; or 5 followed by a def., *wa-rim-ge*.

Quinary and binary names are preserved in some of the proper M. P. dialects. Formosan has *na-ta.p* 6, from *na-ta* 1, in addition to *ni-nam*. A binary 8 occurs in the same dialect, *maas-pat*, &c. (*nas-pat* 4),—in Ende and Solor, *rua-n-bututu* (2. 4), *butu* (*butu*, *wutu* 4),—in Timor Kupang, *ka-far* (*an-far*, 4, *Kel*).

If the M. P. and Papuan systems are formed from the same numeral elements, it is probable that the former is a concentered variety of the ancient quinary system. The mode in which the Papuan systems vary in their units, and the use by the same dialect of one unit in 1 and another in 5, 6, or 10—an irregularity observable in the numerals of other families—would explain how the dialect of a dominant Sumatran tribe might retain an obsolete 1 in contracted remnants of higher compound numbers, and disseminate it throughout the range of the Niha-Polynesian currents.

The M. P. numerals appear to be composed of the common Himalayo-Polynesian definitives.

1. *sa*, *ta*, *si*, *ti*, *di*; *ra*, *ri*, *le*, *ni*, *ne*, *nai* (*u-na*, *o-na*, *u-on*, *u-nii*, *e-nah*, *e-not*, *nait*, *ta-mo-nah*) &c.; and various compounds, e. g.—*sa-da*, *se-di*, *sa-ra*, *si-ri*, *sa-tu*, *ta-sa*, *ta-lua*, *ta-si* &c.,—either bare, or clothed with prefixes or affixes. *Ta*, *sa*, *si*, *ra*, &c. are definitives current in Himalaic and M. P. vocabularies, and found as the unit in Him. dialects. *O-no*, *i-ni* &c. is the principal Mon-Anam and M. P. def.

2. *du.wa* or *du.a*, (*du.mba*, *di.bah*), *tu*, *ti*, *ru*, *lu*, *nu* &c., is not a common H.-P. def. In H. it is not the current 2, but is used as a unit in 1 and higher numbers.

3. *to.lu*, *tu.lu*, *to.ro*, *tu.lu* &c.; *te.na*, *te.ni*, *te.nu*.

4. *pat*, *am.pat*, *a.pat* &c.

5. *lima*, *arm*, *hand*. In several dialects 1 is used, i. e. *one hand* or *tale*.

6. *a.nam*, *u.num*, *a.nung*, *o.nong*, *e.neng*, *o.no*, *e.ne*, *fe.ne*, &c. (1 for 5, 1).

7. *pi.tu*, *pi.du*

8. *wa.lu*, *wo.lu*, *a.rua*, *ha.lua*, *a.ru*, *pa.nu*, *fa.nu*, *wa.nu*.

9. *si.wa*, *si.ba*, *si.am*, *ak-se.ra*, *e-sa*, *sanga*.

10. *pulu* &c. *u.lu*, *u.nu*; *putu*, &c.

The Papuan quinary system elucidates the M. P., which is simply a dialect of it with the compound names contracted.

The root in 2 is *du*, *tu*, *ti*, &c.; *lu*, *ru*, *nu*, &c., *wa* being a postfix or augment preserved by the dissyllabic form of the current system. Comp. *si-wa* 9 (=1).

3 appears from the Papuan and Formosan examples to be related

to 2. It is probably 1. 2, (to, tu, te &c. 1, lu, nu, ni &c. 2); or 2 short of 5.

4 appears to be a contraction of *pa-tu* 2 (2 dual). See 7, 10. But it may have been 1 *pa-tu*, *bu-tu*, &c. from 3. 1, or 1. 5, i. e. 1 short of 5. *Patu*, *butu* (Solor, Ende) resembles the archaic unit preserved in 5 and 10. Five, i. e. *one hand*, being the highest numeral of the ancient quinary system, and 10 having been merely "second hand" or "one hand again," it is probable that in the earliest form of the second series, the mode of formation was precisely the same as in the first. Hence 7 would correspond with 2, 8 with 3, and 9 with 4. In systems formed by addition $3=2.1$, $4=2.2$, $8=5.3$, and $9=5.4$. But in subtractive numeration $3=2.5$, $4=1.5$, $8=2.5$ the second, and $9=1.5$ the second. Yap has a subtractive 7 *me-deli.p* (thale.p 3); 8 is *me-ruk* (ru 2, *we-luk* in Yengin, New Cal., a-lok 8 Pak-pak, Bata), 9 *me-re.p* (re.p 1). 5, as in the Papuan dialects, is *one-hand*, contracted to *one*, and in the current M. P. systems, to *hand*. See 10.

6 is a current 1 (for 5.1), the com. nasal def. of Mon-Anam, Kol and M. P. See 1. Archaic full forms, *nam*, *nang*, *nung* &c., are preserved in H. Lau has still *nung* as its unit. Papuan dialects retain full forms 5. 1, and use other units, *sa*, *to*, &c. The New Guinea *ma.f.te-ne* 5. 1, has the com. M. P. nasal unit of 6, and it reappears in *a.ne* of 7, 8 and 9. Comp. *ne* Simang, *ni* Dayak 1. *ne* Roti, Timor, *e.ne* Buru, *fe. ne*, *Tu-titi*, *he.ne* Faumotu, 6. The Balad *wa-nim-i* (*nim*=*lim* 5) for *wa-nim-nai* (*nai* 1), is a contraction of *wa-lima-wa-nam*. As examples of other units current as 6, comp. the Vanikoro *ro* 6, *ri-ro* 1 (*ri*=*ra*-in *ra-ru* 3, *ru-va* 4); Aneiteum *ti-ti* 6 and 1, Malicolo *su-kei* 6, *si-kei* 1; Bondi *keu* 1 and 6.

7 is 2 in the current dental form, *pi.tu*, *pi.du*, *vi.tu*, *wi.tu* &c.

8 is 2 (in the liquid form) with the ancient labial prefix, as in the Papuan *ma-ru*, *ba-ru* &c. 2. The augmented form of 2 is found in the 8 of some dialects, Bugis *rua* 2, *a-rua* 8, Buton *dua*, *ruang* 2, *a-rua*, *wa-luang* 8. Eight was therefore 2 short of 10. The *du-lapan*, *di-lapan* &c. of Malay &c. is 2 short of 10.

9 is 1, *si-wa*, *ah-se.ra*, *e-sa* &c. i. e. 1 short of 10. Sunda has *sa-lapan* 9, *da-lapan* 8. The current Malay *sambilan* is *sa-ambil-an*, i. e. *one taken off*, *one less*. The Achinese *sa-kurang* is *one wanting*.

10 is 2, for 2 hands (or fives). With *pu-lu*, *bu-lu*, *ba-ru*, *u-lu*, *u-nu*, current forms of 10, *wa-lu*, *wa-ro*, *ba-lu*, *fa-nu*, current forms of 8 (2), comp. the Papuan *wo-ru*, *bo-ru*, *wa-ru*, *ba-ru*, *po-lu*, *fo-lu*, *pe-ru*, *e-ru*, *a-lu*, *o-lu* &c. 2, and the Papuan forms of 10 in which 5 reappears by itself, or compounded with 2 as in the New Caledonian *pa-in-duk*=*pa-nim-he-luk*, 5.2 (=nim-*we-luk* 7), *du-kowe* (*du* 2 *koe*=*ta-hue* 5, Loyalty I. *lu-e-pi* (*lu-ete* 2 *ti-bi* 5),—and New Guinea *brai-a-re-du*, *rino-tau-rah*.

Although the numeral root took all the current prefixal and postfixal definitives, e.g. *bo-ru*, *wu-ru*, *mon-do*, *su-ru*, *nu-ru*, *re-du*, *ka-ru*, *koi-ru*, *ko-ri-si*, the most influential dialect appears to have affected the labial. The current M. P. preserves it, in several numbers, but usually contracted to a vowel.

1 *a-sa*, *su-o*, *u-su*, *tu*, (*pu-tu*, *wu-tu* &c. in 10); *o-no*.

2 *a-du-wa*, *a-ru-wa*, (*wa-ru*, *ba-ru*, *po-lu* &c. Pap.)

3 (*wa-te.lu* Pap.) 1. 2.

- 4 *pa-t*, *pa-tu*, (secondary form, *wa-pat*, *am-pat*).
 5 (*wa-lima* Pap.) *hand*.
 6 *a-nam*, *o-no* (1)
 7 *pi-tu*, *wi-tu* &c. (2)
 8 *wa-lu*, *wa-rua* &c. (2)
 9 *o-si-wa* (1)
 10 *pu-lu* (2)
 pu-tu, *wu-t* &c. (1)

This persistence of an archaic labial prefix may afford the true explanation of the anomalous labial of the Mon-Anam 1, 2, 3, 4 and 5. The coalescence of the prefix with the root into a monosyllable is one of the most common phenomena in the M. A. vocabulary. If the current numerals were thus evolved, the true analysis will be as follows.

1. *mo-t*, *ma-t*, *mo-i*, *bo-i*, *pa*, =*mo-to*, *bo-tu*, the archaic M. P. *pu-tu*, *wa-t* &c. preserved in the Bhotian *b-chu* (= *bu-chu*) 10
2. *ba-r*, *ma-r*, *pi-r*, *pa*, *ba*, (= *p-re* Mru), = *ba-ru*, &c., the M. P. *wa-ru*, *ba-ru*, *po-lu*, *pe-ru* &c.
3. *ba-i*, *pu-i*, *pe*, *ba*, &c. Here nothing is left but the pref. and affix as in *bo-i* 1, *ha-i* = *bai* 2. The root may have been the H. *sam*.
4. *bu-n*, *bu-an*, *fu-an*, *po-n*, *bo-an*, *bu-nu*. The H. 2 *na*, *nu*, *ne* &c.
5. *pa-sun*, *p-ram* &c.; *sam*, *ram* &c. the H. 3 for 3. 2.

The peculiarities of the Malayo-Papuanesian numeral system, considered as a branch of the Chino-Himalaic, are as follows. It does not possess the current C. H. nasal 2, *ngok*, *ngo*, *ngi*, *ni*, &c. found also in the C. H. 5 (2 for 3. 2) and the *Himalaic* 7 (2 for 5. 2). In lieu of the nasal root it has a dental passing into the liquid, being the C. H. *unit* preserved in the Lau sibilant and Mon-Anam liquid 2, in the common C. H. 4 and 6, and in the 7 of Chinese, Bhotian and some southern dialects. The forms preserved in the C. H. 6 (1 for 5,) *duk*, *luk*, *rok*, *dhu*, *tu* &c. are identical with the M. P. root *du*, *ru*, *luk* &c. The C. H. nasal 2 is itself a def. and unit (e. g. *nung* Lau), and in its original form was probably reduplicated or added to the sibilant, as in the Changlo *ngik ching* 2. The M. P. 3 appears to be 2 (for 2. 5), while the C. H. is 1 (for 2. 1). The M. P. 4 is the common dental (passing into the sibilant and liquid) 1 (for 1. 5),* and agrees with the current C. H. root in 1 &c., with the archaic Chinese unit preserved in 100 and 8 (10 for 2. 10), and with the Bhotian *b-chu*.

In its use of the dental and sibilant 1 it agrees with Tibeto-Burman; its nasal 1 (1 and 6) is Mon-Anam (Lau); its dental

* In transferring the Chino-Himalaic sibilant and liquid 4, *b-zhyi* *p-li*, *g-zha*, *lha*, from the dual to the unit series, 1 explained it as 1 for 3. 1. If the M-P. 4 were 1 short of 5, the C-H. 4 may have been formed in the same mode, but as the C-H. 5 was not a substantive word, but itself a numeral compound 3.2, this is not probable.

and liquid 2 in archaic Tibeto-Burman (duk, luk, ruk &c.,) and current M. A.

I do not here enter on the reconsideration of the origin of the harmonic, agglutinative and vocalic character of Malayo-Polynesian. It must either be native or Gangetic. The latter had a decided tendency to a similar phonology; and the Kol, Nipal and even some of the more eastern dialects have examples of Himalaic consonantal monosyllables rendered vocalic and dissyllabic,—usually by the incorporation of a vocalic postfix with the root. It would appear that the Papuanesian languages brought this phonology from India, but that the highly harmonic and vocalic variety of M. P. was an insular development of it. In analysing the M. P. vocables there is often great difficulty in distinguishing the root from the definitive. If early Himalaic had been purely prefixal or purely postfixal in its substantival definitives, the task would have been comparatively easy. But while chiefly prefixal, the major, minor, and sexual definitives were usually postfixal. The Oceanic variety was also mainly prefixal, but many of the older dialects are also postfixal. In Malay the concreated prefixes can, in general, be readily recognized, because they are radically identical with the definitive prefixes current in it or in other dialects, and preserve the vowel. On the other hand the final consonant is often perplexing. Final -t and -n are certainly remnants of postfixes in many cases, as in *langi-t sky*, *mulu-t, mouth*, *langa-n*, *tanga-n*, *arm*, *hand*, but in others they are radical.

Himalayo-Polynesian may either be considered as an alliance consisting of three families, or as a family consisting of three sub-families. As ethnology resolves itself into genealogy, the use of all such terms is necessarily relative and indefinite. The widest alliance is ultimately a family, of which Chinese, Scythic, Caucasian, Indo-European &c. are but sub-families. The differentiation of the three branches of Himalayo-Polynesian is greater than that of the several branches of Indo-European, or even of Scythic, but—if we exclude the monosyllabic character of the dialects which have been long influenced by Chinese—not greater than that of the Semito-African, or even of the more limited and included Libyo-Zimbian, alliance. If the preservation of a close degree of likeness in structure, in definitives (pronouns included), in native numerals, and in native roots, constitutes a family, Himalayo-Polynesian does not form one, nor does Himalaic itself. But if a large and close affinity in roots—pronouns included—and a radical simplicity of structure, lying, in all its variations, between monosyllabism and agglutination, are sufficient to maintain the family union, despite great diversities

in collocation, Himalayo-Polynesian may be described as one family, although in collocation the branch that has remained in Upper Asia agrees with Scythic, and the branch that earliest spread over the islands of the southern ocean agrees with Semito-African, more than they do with each other. The more important of the peculiarities of each branch are, that while Tibeto-Burman is now postpositional and inersive in collocation, with the exception of the position of the qualitative and of the remnants of the prefixes, Mon-Anam and Malayo-Polynesian are direct and prepositional, (postfixes or their remnants being also used, as in other prepositional languages); while Tibeto-Burman is more agglomerative than agglutinative and harmonic, and Mon-Anam (placing Kol aside) is crude and monosyllabic, Malayo-Polynesian is as harmonic and agglutinative as Scythic; while the general roots are often slender and contracted in Tibeto-Burman, they are often broad and full in Mon-Anam and Malayo-Polynesian, while in numerals Tibeto-Burman is Chinese, and Mon-Anam is only partially Chinese, Malayo-Polynesian is peculiar.

The modification which my previous conclusions undergo by the negation of a supposed Malagaso-African ingredient in the Papuanesian formation, is, that the latter remains purely Tibeto-Indian. The Australian and Australo-Tamulian affinities of Papuanesian are unaffected. The material African affinities become archaic Indo-African, derived from UltraIndia and India, and not in part from Madagascar. The second great Asonesian formation—the PAPUAN—was, therefore, Himalaic, and in no degree Malagaso-African. It was but an older and richer form of the third—the MON-ANAM—and its harmonic, agglomerative and agglutinative character, as well as many of its roots, indicate an ultimate connection with the first or DRAVIRO-AUSTRALIAN. In pronominal and many other roots, in structure, and in collocation, it is Himalaic and not Draviro-Australian. Its Indian source must have been the ancient Gangetic formation, of which Kol is an impoverished remnant modified by Dravirian. *

* The Kol affinities of the Bima-Arnan group (specially connected with the Papuan) to which I have often referred, may now be considered as characteristic of the oldest or Papuan form of Malayo-Polynesian when it was introduced from the Gangeto-UltraIndian province. The peculiarities of this group were described in the section of my 3rd chap, headed "East Indonesian." The E. Indonesian character of Viti, Rotuman and Tarawan was remarked, and as "there was the strongest reason to expect that the Melanesian languages nearer Australia would prove [like that of Tana] to have a similar character," it was probable that the East Indonesian system would be identified with the Papuan,

The relation of this primary Gangetic or Himalayo-Polynesian formation to Dravido-Australian and to Himalaic proper, appears to me to be little affected by the recognition of a more cumulative pronominal system and a somewhat larger degree of harmonic power in the archaic languages of Tibet. Dravirian and Australian separate themselves from Himalaic not only by phonology and structure, but by roots. The pronouns of Dravido-Australian are more purely Chinese in form. The general vocabulary has Himalaic affinities, like the Indo-European, Caucasian and Semito-African tongues, but it is mainly Scythic and not Himalaic. Australian is closer to the primary Himalaic form than Dravirian or Scythic, simply because it is less concreted. Scythic and Indo-European had a similar form in certain of their stages of growth. The affiliation of languages must rest on the totality of their characters, on roots as well as structure. The Semito-African basis structure is more akin than that of Dravirian to the Himalayo-Polynesian, for, in addition to the cumulative system of definitives and formatives which characterised all the harmonic languages at one period, it has much of the direct and prepositional collocation which distinguish Mon-Anam and Malayo-Polynesian from Australian, Dravirian, Scythic, and even, in a considerable degree, from Tibeto-Burmar. Himalayo-Polynesian, Dravido-Australian, Caucasoid, Indo-European, Scythic, N. E. Asian and American, in their pre-inflectional and pre-agglutinative stage, group themselves around Chinese. Each family, through the influences of geographical dispersion, lapse of time and contact with other families, has produced sub-families, which, in proportion to their antiquity, differ from each other in vocables and form. The Caucasoid, the Dravido-Australian and the Himalayo-Polynesian families were spread over large southern regions in very remote periods, and their sub-families appear to have been thus separated from each other long before the dispersion of the Indo-European family. Hence two sections of one of these large and ancient families or alliances may show variations from each other nearly as striking as those, for example, which distinguish Indo-European in its pre-inflectional stage from Ugrian. Dravido-Australian, in its ancient Australoid condition, was one of the Chino-Scythic families,—Chinese in its principal pronominal and many other roots, as

and be found "to sweep in a great curve round N. and E. Australia," its extremities being Bima on the one side and Tasmania on the other. A subsequent minute comparison of the Papuan with the Aru-Biman or Timorian vocabularies has verified this conclusion, and shown also that a branch of the East Indonesian current embraces Micronesia. See a paper on this subject in the Pinang Gazette. The close affinities in customs between the Kola and the Timorians were noticed in my first paper.

well as in its ultimate structural basis,—Scythic in its special structure, and in the majority of its substantial roots. The archaic Himalayo-Polynesian or Gangetic was also Chinese in its pronouns, but with well pronounced variations which demarked the system alike from Chinese and Dravido-Australian,—in most of its roots it was Chinese and Scythic,—but its structure deviated considerably from Scythic. Tibeto-Burman is Himalaic in roots and in much of its structure, but it is much more Scythic than the earlier branch; the variations from Mon-Anam and Malayo-Polynesian in the forms and applications of the roots of all classes, including the pronominal, are very great. The correct inferences appear to be that Dravido-Australian participated in the Scythic development before it entered India; that the first Tibetan migration to the south took place before Himalaic had acquired a strongly Scythoid structure; and that the Scythoid structure of the second great migration—the Tibeto-Burman—was subsequently received in Tibet. The earliest Ugro-Tamulian movements to the south would thus appear to have been directed to the westward of Tibet, and the second great Himalaic migration to have been separated by a very long interval from the first. That Dravido-Australian, archaic Himalayo-Polynesian and Tibeto-Burman should have received developments differing so much, while one in their ultimate pronominal basis, may appear anomalous; but the ethnologic peculiarities of the S. E. Asiatic province are not greater than the geographical. The latter, like the former, may have been lessened by the lapse of time. At all events it is clear that the passage of the great southern mountain chains of the Asiatic plateau was, necessarily, far more formidable in the earlier milleniums of Turanian history, than it was when civilisation had made some progress.

I shall rewrite the Mon-Anam section after printing that on the Himalaic pronouns and particles. In the meantime I issue the printed portion as it stands (p.p. 153 to 176) as an appendix to the present notes, much of it being new and unaffected by my recent conclusions. The more important corrections may be briefly noted. The current Mon-Anam pronouns are a corrupt remnant of the early and elaborate Himalaic system; and the Kol, Gadaba and Savara forms are chiefly Mon-Anam, but with some Dravirian elements.* The principal corrections are that the Kol 1st, aing &c.—a-ing, I, 2d,

* My original view of the position of the Kol is substantially in accordance with my present conclusion. "The phonetic basis of the language and many particles and words are Dravirian, but the pronouns, several of the numerals and a large portion of the words are Mon-Anam" (chap. IV sec. 6). The language I would now describe rather as Gangetic modified by Dravirian, than as Dravirian modified by Gangetic.

me &c. *thou*, with the plural labial forms of both persons, and the corresponding Mon-Anam pronouns, are Himalaic.* The Kol liquid 3rd pron., *i-ni* &c., is also Himalaic. The Anam *tua*, *thou*, is radically *body*, *animal* &c., and is hence used for *self*, *himself*, &c. Eng. used by itself for *thou*, is also properly *self*, and in the other persons may follow the pronoun. Among the numerals the Savara and Kol 6,—the Savara 7, with the corresponding Savara and Kol 10,—and the Savara 8 and 9,—are Himalaic.†

While the Mon-Anam pronominal system possesses no roots that are not Himalaic, the labial of its numeral system remains peculiar. Its Dravirian affinities have been fully exhibited; but, independently of the light thrown on it by the Papuanesian numerals, I should now be disposed to see in it the remnant of an archaic Chino-Himalaic system, differing from the Chinese and the Himalaic somewhat more than these do from each other, and coeval with that stage or dialect of Chinese in which the labial of 8 and 100, *pak*, *pat* &c., was still current as a unit. This very ancient variety of the Chino-Himalaic numerals is closely connected with the Dravirian and Draviro-Australian, as was formerly shown; the Dravirian *voka*, *potta*, *patta*, *badu* &c. of 1, 9, 10, 100, being a vocalised form of *pak*, *pat*. The common form in the Mon-Anam and Vindhyan 1 and 10 *mo-t*, *ma-t*, *muo*, *mo* &c.—but changing to *bo*, *po*, in Savara and Angami—is similar to a common Himalaic form of the labial def. and 3d pron.,—the same that enters into the 1st and 2d pronouns. The form in 4, again, (1 for 3, 1) *von*, *pon*, *bon* &c. resembles the Dravirian 1. It is probable that in this, as in most other cases, East Himalaic has a radical affinity with Dravirian because its connection with Chinese belongs to an older era than that of West Himalaic, and that of Dravirian with Chinese to a still older. In that portion of the Mon-Anam numeral system the Himalaic character of which has never admitted of question with me, the name for 5 is a proof of the separation of the system from the Chinese at a stage of the latter prior to that in which the prevalent Tibeto-Burman separated from it. The original Chi-

* The labial pronouns are identical in root—as I formerly noticed that they were in form—with the Himalaic labial definitive and 3d pronoun. A secondary use of them is as plural and possessive particles. The labial plural of Chino-Himalaic is also Dravirian. But the Gangetic and Malayo-Polynesian use of the labial in the 1st and 2nd pronouns I now consider to be a Himalaic and not a Dravirian trait.

† Here also I return to my earlier inferences. The Himalaic character of the Kol and Savara 6 is so decided, that I recognised with great hesitation the possibility of its being Dravirian. The Anam affinities of the Savara 8 and 9 are obvious, notwithstanding the Dravirian form,—*tamu-ji* 8, =*tam*, 8, Anam; *tin-ji* 9 = *chin*, 9, Anam. The puzzling *gul*, *gel* &c. of 10 Kol, Savara, and of 8 Savara, is Him. in the Angami form *kur*, *ker* 10, i. e. *ku-r*, *ke-r* = *ke-ru*, *te-ru* &c. of other dialects.

nese or Chino-Himalaic name was sam ngo 3, 2, with or without definitives or connectives. When East Himalaic separated from Chinese the compound was in use, for Mon-nam preserves sam, whereas the Tibeto-Burman name is identical with the contracted and comparatively modern Chinese ngo.

In other places I have remarked that the labial unit was characteristic of the older Asiatic numeral system. It is still found, not only in Dravido-Australian and the Mon-Anam branch of Himalaic, but in Scythic, vaik, bat, bit, bis, mis, (variable to bir, per).—Indo-European, we.na, oino-s, u.nu-s, * o.ne,—Caucasian ar &c.(=war,)—Euskarian bat,—Semito-African, wal, war wan, mosi, wot &c.

I have already considered the question whether the labial initial in this almost universal form of the unit is radical or merely prefixal and concluded it to be the latter.†

We have seen (p. 91) that in the archaic Himalayo-Polynesian numeral system the labial was the common definitive preposed or prefixed, and the labial numeral element of Mon-Anam appears to be a remnant of a similar system.

To the proto-Scythic stage of the Mid-Asian languages—from which all the great outlying families, American, Himalayo-Polynesian, Dravido-Australian, Indo-European, and Caucaso-African have been derived—this widely prevalent form of the unit is to be referred. The Sechuana and the Papuan *mo-e.si* are really identical in origin, although we can no longer hold that Africa communicated the numeral to the Eastern Islands. Both the western and the eastern negroes brought it, with most of their other

* "The root appears to have had originally an initial *y* or *v*." Smith's Lat. Dict.

† Whether the primary Chino-Himalaic and Dravirian unit were mok, mot, pak, pat, &c.—or *mo-ka*, *mo-to* &c.,—or *mo-ka*, *mo-ta* &c.,—the oldest extant forms present us with the labial initial and a final k, t, s, r, n, probably variations of one original sound. The labial and aspirate initials are so unstable, that, to account for the variation of bat to at or ta, and of bis to is or si, it is not necessary to assume that the original form was ba.ta, bi.si. Thus the Mon-Anam *mot*, *mat* corresponds with the Dravirian *vodda* 1, *pada*, *bad* &c. 10, as well as with the Chinese *pak*, *pat* in 8 and 100. So also the *bar*, *mar*, *bagr* of 2 (*bok*, *blng* in 7) whether it be radically *bar*, or *ba-ra*, or *ba-ra*, corresponds with the Dravirian *i.r.e.r*, and with the Scytho-African *mal*, *mala*, *bari*, *biri*, *vidi* &c. Ultimately it is identical with the unit,—2 in the primary numeral system being 1, 1. In Zimbrian "the labial prefixal element has generally the form *mo*. The same combination is found in other formations, and whether both the definitives are to be considered as being primarily a def. compound used as the numeral, or a merely servile function is to be ascribed to the postfix or prefix, must be doubtful in most cases, the relative position of the principal and accessory definitives having varied even in the same forma-

common possessions in phonology, structure and roots, from the central ethnological province of Asia, where vestiges of a similar form of language are preserved in the prefixal Yeniseian and in the still more agglutinative and agglomerative N. E. Group.

tion. If the original form of the Semitic unit were wa-hi, wa-kha &c., it would follow that all the Semito-Libyan forms of the sibilant, aspirate, dental and guttural definitive and unit might at one time prefix the labial. But in the archaic non-concreted condition of the glossary it is clear that each definitive had a separate currency and was capable of being used as the unit. The combinations indicated special distinctions, sexual &c. The replacement of s, t, by r or l, found in the Arabic ordinal 1, takes place in the Zimbian cardinal 1. This tends to the conclusion that wa, war, wat, wah, wak or pak, bas, mos &c. are all variations of one archaic term, whether simple or compound. A similar range of variation occurs in those forms of the Scythic unit which have the labial prefix. From the general structural analogies of Semitic in its most archaic stage and of Zimbian in its existing one, it is probable that in mo-si, mo-ri, as in the Semitic wa-hi, wa-li, the labial was primarily accessory. In form it corresponds with the Egyptian *uo* of *uo-t=wo-t*. [See App. 1, One B]. The following are examples of the Zimbian term,—mo-ja Suaheli, *u-mure* (contracted) Ki-Kamba, mo-dya Makua, *yi-mo*, *lu-mo* Mudjana, (probably contracted terms with substantive prefixes, similar to those taken in other Zimbian languages when the numerals are used as qualitives), mo-yi, mo-ji Makonde, mo-si Takwani, po-si Masena, Sofala, mo-esi Sechuana, mo-si Benguena, Kongo, Kambinda, mo-shi Angola, i-mo Mundjola. Yoruba, which in one dialect uses the Zimbian labial prefix with its numerals, has the same form of the unit in 9 (1 from 10), *ma-i-so*." *Ethn. I. P. I. App. to c, iv, sec. 6.*

THE NATURAL SELECTION OF HUMAN RACES.

Darwin is doing for zoology what Lyell has done for geology. He multiplies and intensifies by time the infinitesimal changes that take place under the observation of a life; and he finds that this enables him to dispense with those hypothetical interferences *ab extra* with the constant—and Divine—course of nature, which play the same part in some European cosmogonies, that the frolics of gods and giants and the motions of earth-sustaining tortoises and snakes, do in those of the East. He appears to have some hesitation in submitting his own species to the genesis which he ascribes to its lower fellow creatures. And yet man more even than his congeners illustrates the law of "natural selection." Whether, with American ethnologists, we hold Australians, Papuans, Hottentots, to be so many distinct species of the genus man, or consider them to be simple varieties, it is clear that the higher, and therefore stronger, races of mankind are gradually extirpating the lower. The globe is a Procrustean bed for the animal life on it. Nature is only enabled to make room for a few lives by the constant destruction of the many, and she sweeps away races as well as generations. In the lapse of time the weaker individuals and varieties perish before the stronger. The higher development of sentiment which we find in man expedites, in place of retarding, the process of extermination. The "natural man" has an antipathy to alien forms of his own race. The Andaman negro has no respect for the leading race and murders an Arian as naturally as a pig; and the uneducated European more than reciprocates the feeling of repugnance. He has more toleration for a baboon than a Tasmanian, for a poodle than a little blackamoor. His feeling towards the inferior tribes of his own species has even less humanity in it than that with which he regards the lower ani-

mals, for it has a strong ingredient of contempt and dislike, which any assertion of right on their part, in opposition to his will, rouses into ruthless hatred. "Shooting blackfellows" is the instinct of almost every Australian settler in the bush except the best educated, and nothing but the law prevents the Natives being hunted down like kangaroos. In Van Dieman's land, where the race was still more degraded, Europeans, educated and non-educated, combined to extirpate them as vermin, and the Government sanctioned the battue. The paper in another page shews that the United States Government is utterly powerless to arrest the operation of the grand law of "natural selection," and that the Indians will soon be numbered with the other extinct animals of the New World.

The lower varieties of mankind that still survive are marked for a rapid destruction, because there is no longer room for them. The century has come in which their territories being wanted by a stronger race, are taken by it, and, as it cannot utilise the prior occupants, they must depart from this world for ever. The same doom must, of necessity, have frequently overtaken prior and still lower varieties of man. Hence it is that the hiatus between him and the nearest akin of the Bimana widens as the race advances. Link after link of the long chain of varieties disappears. In the great book of geology most of the leaves are zoologically blank, the written ones are tattered, and a large proportion of them, including most of those containing the records of the human era, cannot be turned over by us, because they lie beneath the floor of the ocean or buried under lakes.

THE INDIANS OF AMERICA.

In the early settlement of New England, where the Indian race was quite numerous and warlike, the language of the Massachusetts tribes was mastered by the celebrated *John Eliot*, usually called the Apostle to the Indians. He was born in England in the year 1604, and graduated at Cambridge University; soon after which he emigrated to Massachusetts in the year 1631, and in the year following was settled as the minister of the town of Roxbury, adjoining the present city of Boston. Roxbury as well as the adjoining towns was then full of Indians; but now the same town, then all a wilderness and peopled by savages, is a city with of 20,000 inhabitants and one of the most beautiful in New England, as well as distinguished for the intelligence, the cultivation, and the moral and religious character of the people. In 1646 Eliot commenced preaching, with great zeal, to the Indian tribes around him, having previously mastered their language, into which he afterwards translated the whole Bible. Copies of this translation are now rare, and to be found only in a few public libraries or those of antiquarians. The people of the Atlantic States know as much about the *Malay* language as they do about the Indian. Besides the translation of the Bible, Eliot published an Indian Grammar and various religious books for the use of Indians. There were at that time about 20 different tribes within the limits of the English settlers, among whom he extended his labors as far as he was able, and then incited others to do the same. At the time of his death in 1690, he had the pleasure of seeing *twenty four* ordained Indian ministers of the Gospel, who were ornaments to their sacred profession. All of the languages of these 20 tribes were so much alike, that he who understood one, could easily understand all. At the end of his Grammar, the first ever made of an Indian language, he recorded this memorable sentence: "Prayer and pains, through faith in Jesus Christ, can do any thing."

If any thing else was published on the Indian languages in the early history of the Colonies, I am ignorant of it. A School was established at Hanover, New Hampshire, by a christian and philanthropic individual of the name of *Moore*, after whom the School was called, to this day bearing the name of *Moore's Indian Charity School*. A considerable part of the fund was obtained from benevolent individuals in Scotland. The design was the education of Indian youth, who then were found in

the forests in which the seminary was planted. But the Indian youth were to be educated only in the English language, the teachers being utterly ignorant of the Indian. It remains to this day, being an appendage of Dartmouth College, whose trustees also manage it. It has received of late years—as the Indians have receded from the New England States and New York—most of its students from the Shawnee tribe in Lower Canada, and from the Cherokee and Choctaw tribes, now settled to the west of the Mississippi. They have been for the last 40 years engaged exclusively in agricultural and mechanical pursuits, the Government having secured to them a vast territory of excellent land in exchange for their former land on the east of the Mississippi, where the white race had overtaken them. The new home to which they removed about 30 years ago, is 200 miles west of the Mississippi. They have made great progress in civilization, have good laws and good government, are entirely peaceable, and as fully christianised perhaps as any portion of the United States. They have schools, and churches, and ministers, and even a newspaper printed in the language of the Cherokees. About half a dozen young Indians are usually in attendance at Moore's Charity School and Dartmouth College, in which they pursue all the branches of study common to the white young men. A considerable number have completed a thorough course of academical education at Dartmouth College and graduated with honor. They are always popular and petted in college rather than offensive, and though not equal in intellect as thus far developed, especially in mathematics, philosophy, polite literature and the fine arts, they are never behind others in industry, in respectfulness and good morals. At the same College, by the side of the young Indians, may be seen Negro young men, who pursue the same course of study and some of whom have shown considerable talent. The white students generally take no offence, and thus three races from three continents, and of three different colors, are seen side, by side engaged in the same literary pursuits.

The early English settlers diffused themselves rapidly, before whom, by natural causes, the Indian tribes receded, and soon nearly disappeared. In the time of a single generation after the landing of the pilgrims on Plymouth Rock in 1620, only small fragments of tribes were to be found in all the New England States; and now except in three or four obscure corners, one is seldom seen. There was, therefore, no occasion to study the Indian languages or to publish books in them, because they who had used them had fled deeper into the wilderness. Besides, as the Indians had no written language, they had no books to be translated and thus remain monuments of their existence, their ideas and their history. Their mythology was narrow and their legends and traditions few and poor, and whatever had interest has long since been used up with few exceptions, as Longfellow's "Hiawatha", which belongs to the valley of the Mississippi, and a few traditions like it.

The Cherokees and Choctaws are the only tribes which can be said to have been civilised, and promise to endure. Nor will they endure long as a pure Indian race, since their females are of bright intellect and attractive form and features, and are often taken for wives by respectable Whites; and *vice versa*. Not only have large tracts of fine land been secured to them, but the Government of the United States grants a liberal annuity in money for the support of schools, and tools for the

prosecution of agriculture. They have also the right of self-government, and manage their affairs after their own liking. These two tribes are neighbors in the east of the Mississippi, are still in juxtaposition in their new homes, and are the most happy and progressive of all their race.

The fact, however, which is the most remarkable to the student, is the *invention of an Indian Alphabet* for the Cherokee language by a young Cherokee who had been educated by the missionaries, and its reduction to grammatical form. A newspaper has been printed in it in the Cherokee territory for nearly twenty years. Some missionaries and teachers located among another tribe called the Dacotahs, who were situated high up the same great river, and were numerous as well as warlike and wild, succeeded in bringing their language into a grammatical form, using, however, exclusively the English alphabet, and in the language of this tribe for a time they published a newspaper, as well as educational and religious books. But such were the wandering habits of the tribe, and so frequent their wars with other tribes as well as internal quarrels among themselves, that both the paper and the mission have for some time been abandoned.

The tribes in the old States, imitating the Whites in all their vices, while they caught no good influences and conformed to no civilised habits, gradually sunk into hopeless debasement, and dwarfed out, most of the tribes becoming utterly extinct and being forgotten in the very places where they lived and were powerful; while of the best a few representatives only remain, ignorant, vicious and degraded, and hurrying on the utter extinction of their tribes. It is mournful to look over the immense territory they once owned and partially occupied, free, heroic, and in some cases humane and noble, and now see not a trace left behind, except in the famous *Indian Mounds* in the West. But nothing could save them when they came into contact with a superior race. Such seems to be the destiny of all the remaining Indian tribes from the Atlantic to the Pacific, despite all efforts to civilise and christianise them.

Some twenty five years since, John Pickering Esq. of Salem, Massachusetts, one of the ripest scholars in the United States, devoted much time and labour to the study of the Indian languages and reducing them to grammatical form, whether they are living or extinct, and gave the fruit of his labors in a work which contains about all which can be learned respecting them.

According to the Report made to Congress in the present year by the "Commissioner of Indian Affairs," there are at present, within the limits of the United States, about 350,000 Indians, comprising 175 tribes, with 44 of which the United States have made treaties. There have been 393 treaties ratified with them since the adoption of the present Constitution of the United States in 1784. By these treaties 581,163,183 acres of land have been acquired, and the entire cost of fulfilling these treaties has been \$49,817,344. From the lands which have been thus acquired in a wild state, the Government has received at least an overplus of \$100,000,000, above all expenses incurred by the acquisition, surveys, and sale: but long periods have often passed before the sale, when the value of the lands was enhanced by the approaches of civilisation. The Government still holds in trust for differ-

ent Indian tribes the sum of \$ 10,570,649.

The Indian tribes usually consist of from 500 to 5000 souls each. The most numerous tribes are the Cherokees, computed at 12,000, the Choctaws, 20,000, the Creeks, 20,000, and the Sioux, of about the same number. There is a rapid decrease, the diminution in the last 30 years being estimated at between 50,000 and 60,000.

The Indians are tall and straight in form, strong in bone and muscle, and adapted to endure severe hardships. In their black hair, black eyes, dark complexion and in the form of their features, one sees, or fancies he sees, the proof of a common origin with the Japanese.

We may add to our correspondent's concluding paragraph that the extreme N. E. languages of Asia are links between the Tatar and bear the impress of the American languages; and that the Japanese, although Tatar in its general form, has traits which specially connect it with the adjacent N. E. group and with the American tongues, which, broken into a multitude of dialects, still retain a common type, of Asiatic origin.

THE ANDAMAN ISLANDERS.

It is remarkable that islands so highly favoured by nature as the Andamans, contiguous to some of the most anciently civilised countries in the world, and lying in the route of that coasting trade along the Peninsula by which western and eastern Asia were first connected, should never have been colonised by any of the later Indian or Ultra-Indian races who have, in turn, occupied the coasts of the Bay of Bengal. The Dravirians spread to Ceylon and the Laccadives before the dawn of history. The Tibetan hordes had no sooner seized on the seven great rivers of eastern Asia that guided them from the shores of the Sea of Sand to those of the Indian Ocean and the China Sea, than they felt their way to Sumatra and Java, and planted innumerable colonies all over the Malay Archipelago. Why did this, the first great maritime people, whose praus frequented every river and islet from Chittagong to Polynesia, pass by an archipelago that lay full before them, when they first put to sea from the Bassein and Rangoon of those days? The distance of the Andamans from the coast could not be the reason, for the Mid-Asian race are found on the Nicobars. The character of the aborigines could not have offered an insurmountable obstacle to settlement, for the same degraded type of humanity were their forerunners in the Peninsula, in the Nicobars, in Celebes, the Philippines and Ceram, and doubtless in Sumatra, Java and Borneo also. Malaria is equally prevalent on many other coasts where the Tibeto-Polynesian race has made good its footing. The true reason why the Andamans were shunned from an early period, may have been that they were discovered by the Tibetans when their navigating art was still in its infancy, and when they were more ignorant, timid and credulous than their descendants. The first visitors probably carried back an exaggerated impression of the ugliness, ferocity and power of the natives. The Andamans and their inhabitants became mythical like "the land of the monstrous Cyclops" in Home-

ric ethnography, and the myth was communicated to the navigators of every new race that found its way to eastern Asia, till it became one of the fixed and universal facts in the ocean lore of the southern hemisphere, and took its place in the geographies of the Arabs, Indians and Chinese. In that valuable repertory of Arabian sea myths, the voyages of Sindibad, mention is made of a race of blacks inhabiting one of the eastern islands, whose custom it was to seize all who landed on it, stupify and fatten them with some peculiar food, and when juicy and in prime condition to kill and eat them raw, with the exception of the king's portion, which was roasted. Lane thinks this story is founded on one narrated by two Arab authors who describe the islanders as having faces like dogs and their houses as being strewed with human skulls, legs and arms. These allusions indicate the prevalent notions as to the eastern cannibals, but it is probable, from Sindibad making his escape, and, after seven days wanderings, coming to a civilised tribe of pepper gatherers, that the island intended was Sumatra, and that the Battas have been confounded with the Andaman negroes. The Mahomedan travellers of the ninth century distinctly mention Andaman by its present name. Its inhabitants, they say, "eat human flesh quite raw, their complexion is black, their hair frizzled, their countenance and eyes frightful; their feet are very large and almost a cubit in length and they go quite naked. They have no boats, if they had they would devour all passengers they could lay hands on". Four centuries later, Marco Polo gave to the European world the information which he must have gathered from the Chinese and Arab navigators he associated with on his famous voyage from the mouth of the Pei-ho to Ormuz. "Agaman", he says, "is a very large island without a king; the people are idolators, resembling savage beasts; indeed they are a most extraordinary race, having a head, teeth and jaws like those of a dog. They are very cruel, and kill and eat all the men of every other nation whom they can seize. They have great abundance and variety of spices with fruits different from ours, but live chiefly on flesh and milk."

It is probable that when the Burmans and Peguans began to visit the Andamans for their edible birds' nests and when they must have learned how little the wretched inhabitants merited their current character, the desire to monopolise the precious product induced them to keep up the charge of cannibalism. Half civilised traders and navigators all over the world have tried to fence in their commercial preserves by similar means. The Malays defame the Battas, and the Binuas and the Ceramese the New Guinea Papuans, from the same selfish motives that led the Phenicians to conceal the route to the frankincense country and declare that the trees were guarded by winged serpents.

The experience acquired during the settlement made by the Indian Government towards the end of last century has dissipated the fabulous haze in which the Andaman tribe were previously invested. They were found to be weak and dwarfish, living in small and isolated bodies at different spots on the coasts and islets, subsisting not on men but on fish, and not exceeding 2000 to 2500 in number.

They are negroes; and in person, civilisation and habits resemble the most degraded tribes of their eastern brethren. Their height is about five feet, their skin of a deep sooty black and their hair wooly. The nose is flat, the lips are thick, the eyes small and red, and the expression of the face that of wretchedness and ferocity. Like other starveling tribes they have slender limbs and protuberant bellies. They are without any dress, but, to defend themselves from insects, they begin the day by rolling in mud or daubing themselves with it. They give an additional grace to their wooly locks by rubbing them with red ochre. Occasionally the women improve their natural charms by hanging a fringe round the middle. Their conical hovels are made of three or four sticks stuck in the ground and tied at the top. Branches and leaves are hung from transverse sticks, a hole is left on one side large enough for them to creep in by, and the floor is strewn with leaves. Skulls and teeth of pigs are carefully preserved and suspended from the top.

They live mainly on fish which the men spear or shoot with bows and arrows or take with hand nets, and on shell-fish gathered by the women when the tide is out. The men also make excursions in the outskirts of the forest and catch guanos, lizards, rats and snakes. Some hogs of a diminutive breed are found there or in the mangrove thickets. From their scarcity it is supposed that they are not indigenous, but the descendants of a stock left by visitors. No vegetables are planted, but some jungle herbs and fruits are used, including the fruit of the mangrove. Their only cookery consists in slightly broiling their animal food. They have no pots and do not make salt. The great resource of other eastern savages of the coast—the coconut—is not found on the islands occupied by them. No evidence of cannibalism was discovered.

To cross the harbours and pass from islet to islet they use bambu rafts, and canoes made of trunks of trees hollowed by fire and stone axes. Their arms are bows about five feet long, arrows made of reeds tipped with fish bone, hogs tusks or wood burned in the fire, sharp pointed spears of heavy wood and bark shields. The only other art they have is that of making wicker baskets, which are fastened to the back to hold whatever articles of food

they obtain. Like their eastern brethren, and weak savages of all races, they are distrustful, treacherous and vindictive in their relations to foreigners, considering them as enemies to be avoided or destroyed. When a boat approaches they frequently conceal themselves among the trees, while one of them goes to the water's edge and makes friendly signs to the crew. If they land without arms the natives rush from their hiding place and attack them. At other times they affect to receive with thankfulness what is offered to them and then set up a shout and discharge their arrows at the givers. They express their aversion by violent and threatening language, and defiant and indecent gestures.

They are fond of singing and dancing. Their songs are wild, plaintive or lively, melodious, and accompanied by impassioned gestures. They dance in a ring, the principal movement consisting in an energetic kicking and slapping of the hips. When they meet each other they lift one leg and slap the lower part of the thigh.

They worship the sun, moon, and stars, and the spirits of the forest, waters, mountains, storms &c. In the south west monsoon they are accustomed to assemble on the beach or on a rock overhanging the sea and chant a chorus to the storm spirit.

All the attempts made by the English settlers to conciliate the islanders completely failed. But they appear to have been in some degree frustrated by the misconduct of the Bengalis. A party of fishermen captured one of the women and were offering violence to her, when her cries brought a number of the men to her aid. They killed two of the Bengalis and the bodies were afterwards found pounded by stones till every bone was broken. None of the flesh had been taken.

Colonel Symes declares that the Andaman language has no affinity to any spoken in India either continental or insular, and other writers go so far as to say that it appears to be wholly dissimilar to any spoken in other parts of the east. Even Mr. Crawford hazards the assertion that it does not contain a single word of Malay. The truth is that our knowledge of it is limited to a vocabulary of 115 words collected by Lieutenant Colebrooke. It is not explained how these vocables were obtained, and the circumstance of the list including names for some animals not found on the island throws some doubt on the critical skill of the collector. That names should be conferred on animals seen for the first time is quite probable, but such names are usually either those of familiar animals or merely adjectives descriptive of some trait that has struck the first observers. Short as the vocabulary is, some of the words are Himalaic, agreeing most closely with those of the tribes that preceded the Burmans in Arracan. Those who maintain that

the eastern negroes are but debased families of these ading insular race, will see in this an evidence of the Andaman savages being of Tibetan origin, like the Burmese and Malays. Those who hold the races to be distinct will infer that, at one period, the ancient occupants of Arracan, whose descendants are still found in Manipur and the hills, carried on an intercourse with the Andamans and planted colonies there which died out when the mother country passed into the hands of foreigners. The Papuans everywhere display a remarkable aptitude for acquiring foreign words. The only other western remnant of the race, our Simang neighbours, have many Peguan words which they must have obtained at some remote period, when colonists from Pegu held the place now occupied by the Malay colonies of Kedah and Pera'. Some of the bands speak Siamese although they have ceased to hold intercourse with that people, while all have largely adopted Malay. But no ethnologist would conclude that some troops were of Malay, some of Siamese, and some of Peguan, descent. Language elucidates the history of a people, but it cannot, by itself, determine their affiliation. The most numerous and close affinities of the Andaman vocabulary are Scythic and Caucasian, like those of all the other outlying races—Asiatic, African and primitive European.

Whatever the true relations of the language may be found to be, it is certain from their physical and mental character, their arts and habits, that they are simply one of the surviving branches of the Papuan race of the eastern islands. It is no more necessary to bring this particular remnant at a recent period from Africa with some writers, or from New Guinea with others, than it is to bring the Javanese directly from the banks of the Tsang-po. Thousands of Tibeto-Polynesian communities exist in eastern Asia and its islands because the race descended the Himalaya at an early period, and hundreds of Papuan hordes are still found because they were the prior human inhabitants of the same region. Whether the race was created in this portion of the globe or had slowly spread into it from some other province is a question by itself.

The Papuan affiliation of the Andaman natives makes it necessary that those who may be charged with the formation of a new settlement should make themselves acquainted with all that is known respecting the eastern Papuans and the best mode of dealing with them. Mr. Earl's work will be of great assistance to them, and as he is now in the service of the Government at Singapore, his experience might be made available in avoiding some of the errors incidental to the formation of new settlements. The most just mode of dealing with the natives should be determined

from the first and inflexibly adhered to. If matters are allowed to take their usual course there will be mutual crimes, mutual revenge and a gradual extermination of the ancient race. It would be more humane to begin the work of settlement by hunting them down and hanging them off the face of their island at once. If they are simply to be treated as a race of murderers, better put them out of pain by a wholesale execution than subject them to the slow and deadly torture of an intercourse with a half civilised and wholly debased community of convicts. But if their habits of assailing foreigners is viewed in what is probably its true light—as being in its origin not only superstitious or instinctive but a measure of selfdefence—it becomes our duty to effect our object at the least cost of suffering to the natives. Forbearance must be the great rule. To intrude on them is to provoke their anger and hostility. For a time intercourse ought to be avoided with the greatest care, and it should not at first extend beyond leaving articles of food for them. The system of catching savages by baits to tame them, as you would wild beasts, is an atrocity that we hope will never be repeated by any servants of Government. A single proceeding of the kind will be sufficient to confirm the natives in their belief that the settlers are natural enemies, who must be extirpated whenever opportunities occur. [*January 1858.*]

Since these notices were written the convict settlement of Port Blair has been established, and some additional information respecting the manners of the Islanders has been obtained. But we are still without the grand desideratum, an authentic vocabulary.

THE GOORKHAS,
COLES, AND COGNATE TRIBES OF THE GANGES,
BRAHMAPUTRA AND IRAWADI.

A Bombay paper expresses surprise that the Goorkhas, with their diminutive stature and peculiar appearance and habits, marching ordinarily, with the protection of fan and umbrella, at no greater rate than five miles a day, should be of the same race as the tall and handsome sepoys from Oude. The truth is that the sepoys are much more akin to the English soldiers from the shores of the Atlantic with whom they are trying conclusions, than to their Nipalese neighbours, who belong to a totally different race. The recent history, which is the whole authentic history, of the Goorkhas is well known, but their ethnography would appear to less generally understood even in India. The united basins of the Ganges and Brahmaputra throughout their whole length, from the Panjab to Burmah, are occupied, in their extensive highland borders, by numerous tribes of one race and tongue, which we cannot term Tibetan because the Tibetans are only a small fragment of this immense family, and which has been called Himalaic because it has immemorially clustered in the inhabitable vallies of that range,—is found on both sides of it,—and, widely spread to the south-east as it now is, has evidently descended by the Himalayan passes from its original home in the alpine upper valley of the Brahmaputra, there called the San-po, i. e. “the river.” The upper valley has been protected by its climate and its mountainous borders from the intrusion of tribes of the alien south-western Iranian race, although not from repeated invasions by hordes of the great northern and eastern race of which the Himalaic family is itself a scion, for in modern times the Nipalese, the Chinese, the Manchus and the Mongols have subdued Tibet, and at a very ancient period the Turks, who for thousands of years have hovered on its northern

margin, appear to have penetrated to the Himalaya. But all modifications which the Himalaic race language, and customs have received in Tibet from these intrusions, have been homogeneous with the original type. In the more exposed southern valley the tribes have been subjected to revolutionary ethnic collisions. On the southern borders of the Gangetic portion of the basin they have been modified by the Dravirian or Kling race, who appear to have occupied India before them, but to have been pressed by them southward into the Dekhan, and westward across the Indus into Beluchistan, where the Brahui are still partially Dravirian. At a very remote period they were themselves disturbed in their possession of the valley by the first, or a new, wave of that stream of migration and conquest—now Scythic, now Turanian, and now a mixture of both with a Semitic tinge, which has flowed from South-western Asia into India—in obedience to a law as powerful and perennial as that which regulates the monsoons. The Himalaic hordes, fresh from a cold climate, were stronger than the effeminate Dravirians of the Ganges; but, inferior in race, physique and civilization, and perhaps deteriorated by the heat of the plain, they could oppose no effectual resistance to the incorrupt Arians of the Perso-European stock, who establishing themselves first in the Panjab, slowly advanced down the Ganges, founding numerous states, and gradually extirpating, helotising, or pushing aside the older tribes. While the Arian race was faithful to its own early instincts and the religious and social institutions in which they had taken form, this was the usual effect of their advance. But with the lapse of time and under the corrupting influence of the new climate and of the native races, they fell away from the Iranian ideal and lost their purity with their pride. They do not appear to have reached Bengal before the tenacity of blood was much weakened, for there is an obvious Himalaic substratum in the population. In Assam their advance was later still, and the Himalaic ingredient is conspicuous. In many other places there has been a free intermixture. Himalaic tribes have been admitted within the Hindoo pale, and a population of mixed blood has been formed. While the Himalaic tribes on the south of the valley have been enclosed between the Dravirian and the Iranian nations of India and completely isolated from their brethren, those on the north have only been separated by the snows and the passes from the Tibetan mother-land, and have continued to receive new immigrations from the banks of the San-po. This has powerfully aided them in maintaining their nationality, vigour and political independence: and long after the spread of the Arians, pure and mixed, to the Bay, they continued to make frequent raids into

the Gangetic kingdoms and even imposed their yoke on them. More than two thousand ago, and not long after Alexander founded the first European state of the east that annexed any portion of India, the last of the purely Arian imperial dynasties of the Ganges was subverted. In after ages it is probable that the lower portions of the valley were only saved from being constantly overrun or permanently ruled by Himalaic tribes, through those successive Scythic dominations which began with the irruptions of the Turks who overthrew the great state of Bactria, and ended with the so-called Moguls. Whenever the governments of the plain became weak the hill tribes ravaged the districts on the north of the Ganges, and sometimes retained possession of large tracts. The district of Goruckpore has not now been occupied for the first time by Nipalese. The Tharu tribe descended from the hills at a remote period and established themselves everywhere north of the Ghaghra. The remains of numerous large brick buildings erected by them show that they long held the country undisturbed. The Tharu had been preceded by another people called Gorkha, and they were themselves conquered by Rajputs with the aid of another of the native tribes, the Bhar, who in their turn expelled the Rajputs. Remnants both of the Tharus and the Bhars are still found in the skirts of the forests and hills.

On the south of the Ganges, the Himalaic tribes have been much influenced by the Hindus. They appear to have all belonged to one section of the Gangetic branch, that which probably predominated in the valley when the Arians entered it, for, unlike the northern tribes, they retained the same dialect from the borders of lower Bengal to those of Khandish. On the one side they are found within two hundred miles of Calcutta in Singbhum, and on the other within four hundred miles of Bombay on the Gawil hills, where they have been erroneously named Gonds and thus confounded with a totally different people, a branch of the native Dravirians. Their generic name for man,—*koro, kolo, koli, kol* &c.—is that by which they are almost universally known, (Cole &c.). Tribes and classes distinct from the predominant population are found with the same name, *Koli* &c., beyond the Gawil hills along the western sea-board, as far south as Goa and as far north as Guzerat. Even in the last district the Chinese and Himalaic system of clans is maintained by them in full force, marriage between persons of the same clan being prohibited as among the Vindhyan Kols, and the name for clan being similar. Some of the usages which distinguish the *Koli* from the rest of the population are also *Kol*, and there is a little room for doubt that the *Koli* class of western India (whence our term *coolie*) are con-

nected through the contiguous Gawil Kols with the Sonthals and other cognate eastern tribes who preserve the native dialect, and that the western clans are simply fragments of the nation that occupied the whole Gangetic valley when the first Arian kingdom was founded between the Sutlej and the Jumna, some forty centuries ago. That the Kols were for many ages and at a very remote period the leading Himalaic people on the Ganges, or at least in Bengal, is attested by the abundant traces of their vocabulary which remain in the languages of the oldest and most remote Himalaic nations of the trans-Gangetic peninsula. The Cochin-Chinese, immemorial neighbours of the Chinese, the Kambojans, the Peguans—that is, all the older sea-board nations of the eastern Peninsula—are either Kols a little disguised by total separation and by foreign influences, or sister tribes that long occupied Bengal contemporaneously with the Kols, and carried eastward a large stock of Kol words, including pronouns, numerals and the names of many familiar objects. The place which this branch of the Southern Himalaic people once held in India and the farther east may be inferred from the fact, that the aborigines of Province Wellesley, the Papuan Simang, use some of the Kol pronouns and numerals, and that many other Kol vocables are found not only in Simang but in the languages of the Archipelago.

The northern margin of the basin affords no evidence that any one tribe ever attained so wide and durable a range and influence as the great southern nation, for the comparatively recent movement of the Bhotians from Tibet, although felt in Cashmir on the one side and in China on the other, and at one time threatening to overwhelm Bengal, is no real exception. Except in Bhutan, the older tribes recovered their independence while retaining a strong impress in their language of their temporary subjection to Tibet. From the Milchangs, in Kanawar, along the lower Himalaya to the Mishmi at the head of the valley of Assam, and thence westward, along the southern margin of the valley, to the Garos, there is a succession of distinct tribes, each speaking a peculiar dialect of the common tongue. Beyond the Assam range numerous cognate tribes are spread over the eastern Peninsula, pressing on those of the older migration, and enveloping some, like the Kasia, the Pa-laong and the Peguans. This great subdivision is a result of the low civilisation and of the mountainous territory of the race. Had the Arians not appeared on the scene, the Gangetic valley might, in time, have enabled the Kols, by their numbers and civilisation, to absorb the northern tribes or impose their dialect on them, just as the Burmese were enabled, by their possession of a favourable part of the valley of the Irawadi, to surpass their sister tribes, and to proceed far in the work of gradually subduing

and absorbing them and extirpating their dialects, when the Burmanisation of the basin was rudely checked by the intervention of the British. Although none of the other tribes appear to have ever become so influential as the Kol, there is distinct evidence of some of them having acquired predominance for a time and carried their conquests to a distance. For example, a northern offshoot of the Manipuri group of tribes, now divided into the Khari, the Nogaung and the Tengsa, appear at one period to have advanced not only up the Assam valley, but westward along the course of the Ganges as far as Nipal, for vocables which have the peculiar mark of their speech are found in certain of the north Asamese and Nipalese dialects.

The very generality of the preceding remarks will serve to convey a more distinct idea of the real ethnic place of the Goorkhas than a minute account of their special ethnography. The principal Himalaic tribes between Bhutan and the Sutlej are the Lepcha of Sikkim—of whom Cunningham and Hooker had close and not always pleasant experience,—the Kiranti and Limbu, the Murmi and Newar of the Kosi valley, the Magar, Gurung and Sunwar who were originally located beyond it on the west, the Milchanang and Tiberkhad in Kanawar. The Goorkhas lay claim to Arian origin, but they are really Magars. They and the Gurungs were spread eastward into the valley of Nipal by the Goorkha conquests last century. The Magar dialect is as Himalaic as the Burmese or the Bhotian; and the Goorkhas, with the other tribes of the cluster, are in person Himalaic, like the better known Burmese and Malays. Thornton, indeed, says that between the Goorkhas and the Newars there subsist the most marked differences, as well in character, manners and features, as in religious rites and language. But for this statement there is not, as regards features, any other foundation than the pretension of the Goorkhas to descent from the Hindus, whose religion they have adopted and whose intercourse with them has given to the population a certain proportion of men of mixed race. He was probably misled by the unscientific observations of Kirkpatrick, which were corrected by that accurate and experienced ethnographer, Buchanan Hamilton, who was as familiar with Chinese and Burmese as with the different races of India. Hamilton admits that the Newars are themselves becoming Arianised in feature from the lax habits that prevail, and that many of them have high features, large eyes and oval faces. He agrees with Kirkpatrick that the children of a Rajput father and a pure Newar mother may be almost taken for Malays, that is, he adds, a mixed type between a people of Chinese race and Hindus and Arabs, from which it may be inferred that he had not seen the pure Himalaic Malay, small in stature and thoroughly

Mongolic in feature. The population of Nipal is undergoing the same change that metamorphosed the flat nosed, small eyed Turk and Ugrian into the Osmanli and Hungarian, a change that takes place wherever a race of lower organisation is permanently intermixed with one of higher, and results from a deeper and stronger law of nature than that which shows itself in the thousand forms of caste. The eternal law everywhere prevails over the secular, which it involves and ejects. [*February* 1858.]

THE EUROPEANIZATION OF THE INDIAN RACES.

In some remarks elsewhere on the principles that ought to guide the relationship of civilised races to those inferior and subject to them, we ventured to say that the ethics of ethnology would become the most important practical science of the day, for those Englishmen who find themselves charged with the great duty of regulating and influencing the position of their countrymen towards the natives of India. At present the feeling reflected by the Indian papers is one of intense and, in some instances, of indiscriminating detestation of the natives, and in an earlier age it would have taken the shape of a cry to place them all in an inferior social condition, and to give the individual European privileges that would everywhere mark him as a member of the rulers caste. At home the indignation has been equally deep, but the arrogant and offensive tone which some of the Indian newspapers have assumed towards the natives as a body has found no echo. The predominant feeling there is a painful conviction of the fact that the savage element in the eastern races is not extinct but latent, and that English influence on the people of India has hitherto been exceedingly slight and superficial.

A very important portion of the public have decided for themselves that this has resulted not so much from over toleration of the native religions as from intolerance of Christianity, and they demand that it should be openly and consistently professed by the State as the one true religion. The Government is to be at once thoroughly Christian and thoroughly tolerant, and it is hoped that false religion and the false morality assumed to be founded on it, will gradually perish in the presence of the truer and stronger creed.

Another party have little reliance on the influence of a few Europeans scattered among millions, and occupying a station which separates them socially from the natives. Their alien faith, when it takes a narrow and bigoted form, which it too often does in India as at home, helps to repel and offend. With tribes

whose superstitions hang lightly on them, missionaries may succeed single handed. But most of the Indian nations have all the pride and corruption of a very ancient and degenerate civilisation. They have a complex form of society with which religion and all the national traditions are interwoven, and it can only be changed by introducing a new social element,—the presence of the dominant race as a portion of the permanent population.

We agree with those who point to European colonisation as the only practicable means of slowly and partially Europeanising the native races of India. But the European colonists must not bring with them an arrogant sense of their own superiority and an offensive intolerance of the native religions. Conciliation is perfectly compatible with the maintenance of right, and without it the colonists will not obtain that social standing towards the natives on which their improvement depends. Every encouragement must be given to those who are willing to separate themselves from their creed and caste and adopt that of the ruling race. They must be assured not only of protection and cordial welcome, but of support, from the Christian community. Europeans must make common cause with those who thus aid their cause. The class of native converts will continue for a time to be hated and scorned as renegades by their countrymen, and many of them by their character will justify this feeling. But if their association with Europeans be conducted liberally and with forbearance on our side, they will gradually rise, not in character and knowledge only, but in social station. They will, in time, be most trusted and most employed by the State and by private Europeans, because they will be better educated and more loyal than their pagan countrymen. They will join Europeans on less unequal terms in business and in society. They will virtually come to belong to the highest class in the land. A caste that is open to all like Buddhism and that embraces the ruling race, cannot remain for many generations an object of general hostility. The lower native classes will probably be first drawn into it; but the old dominant and exclusive castes cannot continue to maintain their superiority and their faith in themselves, when they find that power, knowledge and position are slowly and surely passing away from them. Hindu zemindars and Mahomedan amlah do more to maintain the native creeds than priests and temples. Our aim must be to replace them by degrees with Europeanised and European landholders and European and Europeanised officials. When it begins to be seen that it is more respectable and advantageous to be a Christian than a Hindu the social revolution will have been accomplished, and not till then. This may appear a very mean and worldly mode of serving Christianity and civilisation.

But it is one which appears to be favoured by Providence, for it has generally been followed by dominant races and it has succeeded. The superior race must make its superiority practically and universally felt. This has often been done by the sword. "Apostatise or die" has been the terse edict of Christian as well as of Moslem conquerors. But this short and simple fashion of legislating creeds is out of date, and we must adopt more common and Christian methods of winning the natives to our faith. Those who cherish the chimera of making an Indian Christian people more Christian than any nation of Europe will condemn a policy based on any appeal to worldly motives. We have no expectation of the kind. When the average Bengali is as Christian in feeling and conduct as the average Englishman or Frenchman, we shall have accomplished as much as universal ethnic experience justifies us in anticipating. In Bengal as in Europe the intensely devotional will be a minority. The majority will devote themselves to worldly pursuits with worldly aims, but, some centuries hence, in a spirit reformed by Christian faith or Christian morality, and at all events with a practice disciplined into honesty by European judges and a larger and closer intercourse with Europeans.

At this dawn of, we hope, a new relationship between the English and the natives of India, it is interesting to recur to the social revolutions through which the various races have previously passed and the means by which they were accomplished. We may glance at some of these hereafter. We believe that in every case of voluntary civilisation the change has been effected by the gradual progress of the opinion that the reforming race was superior, and that it was an honor and advantage to be assimilated to it. The natives must learn to respect the English and feel a desire to be like them before their Europeanisation becomes a possibility. At present appeals to higher motives are, in general, nugatory. The average Indian cannot understand, and hence cannot credit, virtues he does not possess. We must make our first appeal to lower motives and he will in time discover that the power and prosperity of the English race are but the outward symbols of that sturdy force and sincerity of character which gives them insight to discern the right and the will to make it prevail.

Conciliation is not concealment or compromise. Its very object is to bring over others to our way of thinking, and in order that European ideas may have their full sway they must stand out from the Indian in bold relief. There ought to be no reserve in proclaiming our belief and our aims. Englishmen detest the subtleties of Jesuit propagandists and Machiavellian civilisers. The British Government of India cannot, if it would, imitate the secrecy and cunning of Russian policy. It cannot profess one set of

principles in the face of the world, while slowly and surreptitiously working out another confided from minister to minister and from reign to reign.

To many the notion of assimilating Hindus to Englishmen appears a delusion. Race, it has been said, places an eternal barrier between them. Our reply is that morals are conventional, not physical. The Christian are the truest and must be accepted, for the same reason that European science and arts must be accepted. Ignorance of true morality, like ignorance of true physics, will sink those Indian communities that reject the light lower and lower as the European and the Europeanised communities advance; and the natives are far too intelligent and ambitious not to cast off Mahomedanism and Brahmanism when they practically feel into what depths of material degradation they are dragging them.

But the essential difference of race is a mistake. The dominant native race of India is our own, and we have elsewhere and in other times risen from as foul a slough of depravity and cruelty. If the most brutal tribes of Europe received a pure Asiatic faith, and by the slow growth of new habits and the example of their truth-loving Germanic brethren, raised sincerity and self denial into virtues, why should not the Eastern wing of their race undergo a similar purification and transformation? What shape the Indian societies may hereafter take is beyond the reach of speculation. The English—that is, the progressive class, the leaders of national thought—are themselves gradually changing, becoming clearer in their views of nature and advancing to truer and better conceptions of their faith and duty. Europe is changing. The race is swarming over all the temperate regions of the globe, and a century now suffices for movements that one took a millenium. We cannot foresee what England may be, and what our position in India may be, a hundred years hence, but the universal ferment and progress of the western branch of the race must ere long be communicated to the eastern. We have led the Indians in many a battle in which their pulses beat with our own, and we shall yet do so in the war of civilisation against barbarism. The first step is to increase the European ingredient in the population by every means in our power.—[*March* 1858.]

THE AFFILIATION OF THE THREE CLASSES OF THE TRIBES
OF THE VINDHYAS—THE KHOND AND GOND; THE MALE
AND URAON; AND THE KOL.

The Indian Government appear to be testing the military capabilities of the numerous half barbarous tribes, who are scattered over the highlands that rise behind the areas occupied by the civilised races. Several companies of the Gonds have been enrolled in the Saugor territory as a military police. This people have sometimes been confounded with the Khonds, and even well informed writers in the Indian journals associate the latter with the Kols, some portions of whom are now in insurrection. The Sonthals again are spoken of as if they were distinct from the Kols. To enable our readers to avoid falling into these mistakes, we propose to lay before them some details respecting the affiliation and distribution of the highland tribes between the valley of the Ganges and the most northern of the civilised Dravirian nations, the Kalingas and the Canarese.

We may remind them that the oldest Indian race was the Dravirian, which appears to have passed through various stages of a purely Scythoid development, beginning with one which has now no unmixed representative in India, but which has been well preserved in Australia. The earlier migrations into India appear to have been from the north westward, because the Dravirian and Australian languages have strong affinities with the Scythic and Caucasian tongues of Western Asia. If linguistic indications do not mislead in this instance, the primitive land of the Draviro-Australians lay between that of the Scythians and that of the Chino-Himalaic race. After the Dravirians had been long separated from the latter, an ethnic movement began at some remote period—probably not less than five thousand years ago—from Tibet into northern India, by the Himalayan passes, which has continued ever since. During this long cycle of man's history Tibet has itself undergone many changes in its population. Although it is one of the most secluded portions of southern Asia its tribes have

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been much influenced by the incursions of nomadic Tartar hordes and the influx of Chinese. The Tibetan or Himalaic race appears to have been a branch of the Chinese stock which separated from its eastern kindred at a very early period and came under Scythic influence, the language having a Chinese basis, while its general character is Scythic of the oldest type. The hill tribes along the northern margin of the valley of the Ganges still speak dialects of this language. In the outskirts of the hills and in some of the inner vallies both the race and the speech have become Hinduised, but, in general, the inhabitants of the lower Himalaya are Tibetans, like the hill tribes on the eastern borders of Bengal, like the Burmans and a score of wilder septs around them, like the Malays and some hundreds of sister tribes scattered broadcast over the south seas as far as New Zealand and beyond Tahiti.

It is singular how reluctant even the most colonising and conquering of moderns are to recognize the fact that man is essentially a migratory animal, that every age within the light of history has witnessed movements of peoples, and that the countless generations that lived before hieroglyphics must have felt those impulses and necessities for wandering, which are among the most powerful of the great natural forces by which the progress of the race and the replacement of lower tribes by higher are secured. It saves a great deal of troublesome research to take for granted that the men of every country are proper to it like its climate and vegetation, and were placed there on the first confusion of tongues. A new scientific school maintains that each race was created where we find it. The striking diversities that are presented by tribes inhabiting the same land are easily explained by difference in the mode of living, or, with more facility still, by assigning to each its own Adam and Eve. Thus some see in the Sĭmang of Kĭdah but a degraded type of the Bĭnua of Perak. Want of shelter, frequent hunger and other miseries of jungle life have dwarfed the stature, blackened the skin and turned the hair to wool. Others deny the possibility of a metamorphosis of this nature, and declare that the two races have always been such as they now are, and will continue to retain the mark set upon them by their Maker, when He first fashioned them and placed them where they are.

The recent additions to our knowledge of the dialects spoken by the Sub-Himalayan tribes have made it absolutely certain that their Mongoloid features are attributable to no other cause than the simple fact of their genealogy being Mongoloid. The Tibetan province being thus advanced to the borders of the Gangetic plain, the next step in the enquiry is to ascertain whether it had

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reached this line when the Indo-European race spread over the plain,—in other words, which of the two races first moved into India. The answer has, of course, an important bearing on the history of the Tibetan migrations to the farther east. It is well known that the dominant Tibetan nation of modern times, the Bhotian, in the 7th century extended its sway into Cashmere, western China and the sub-Himalayas. If this was the first Tibetan migration to the southward, the Arians long preceded them. The sub-Himalayan dialects themselves demonstrate that it was not. They are Tibetan, but they are not Bhotian. Their distinctively Bhotian ingredient attests the long presence and supremacy of the Bhotians. Their much larger non-Bhotian basis proves them to belong to a branch of the Tibetan or Himalaic family which must have separated from the Bhotian at a very remote period. This inference is abundantly confirmed when we carry our observation to the southward of the valley, for we there find remnants of the same old Tibetan speech, and these were necessarily planted in the Vindhyas before the Arians took possession of northern India. The Tibetans had not only entered the Gangetic basin before the Arians, but had spread over the plain on both sides of the Ganges. The marches between them and the Dravirians were not at the foot of the Himalaya but in the northern highlands of the Peninsula. They had, in fact, made as great an advance into the heart of India as the Arians have since accomplished. The Vindhyas were as much Tibetanised when the Brahmin race settled on the Ganges as they are now Arianised after some forty centuries of Arian vicinage*. When we consider the far greater civilisation and the warlike character of the Arian kingdoms of the Ganges, this circumstance will be allowed due weight. The Tibetans must have been an ancient people in India when these kingdoms were founded.

It will thus be seen that not only the archaic history of India, but that of the older south eastern migrations of the Tibetans and the Arians receive light from that obscure tract of highland and forest in which the southern boundary of the Arians and the northern one of the Dravirians were lost, until discovered by recent explorations in the field and the closet. This tract, formerly known vaguely as Gondwana, received its name from a people whose language is now better known than themselves, and the use of this common name has, no doubt, had some influence

* This period is conjectural. The Arians were probably long settled in India before their population spread to the foot of the Vindhyas.

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in causing the various tribes to be confounded with each other. Its ethnic boundaries are still ill defined and must always have been unstable. On all sides the Hindu or Hinduised races are encroaching on it. On the south it is partially penetrated by two of the civilised Dravirian nations, the Kalingas or Telugus and the Canarese. On the southwest and west the Mahrattas envelope and intersect it. On the south-east the Ooriyas and on the east the Bengalis, have advanced into the vallies. On the north Hindustanis are the principal bordering race.

The tribes thus hemmed in may be divided into three classes. The first comprises the Khonds, properly Ku, and the Gonds, both speaking Dravirian languages without any Tibetan intermixture. The Khonds occupy the south-eastern corner of Gondwana, where they are found on the Bay of Bengal in the Ganjam district. On the north they extend into Orissa, across the Mahanadi, and 50 miles beyond it. Inland their southern limit reaches Bustar. On the N. W. they are found in long. 83°. On the west their area within the province of Nagpore has not been traced. This tribe is peculiarly interesting from their retaining a very remarkable and developed religion, which was probably common, in different forms, to all the civilised Dravirians before they were converted to Hinduism. Human sacrifice continued to be practised by one branch of the Ku until forcibly suppressed by the British Government within the last 13 years, and the practice appears to have prevailed among the Bhils and other Vindhyan tribes in the 11th and 12th centuries from the frequent references to it by Sanscrit writers of that period. The Gonds succeed the Ku on the west, and form the principal population of northern Nagpore and a considerable portion of that of the Saugor and Nerbudda territories. They were the most powerful as well as the most numerous tribe of western Gondwana, but the western and northern divisions were subdued by Akbar and more recently by the Mahrattas. The more central Gonds have all along, from difficulty of access, remained in a state of semi-independence. They are the most sequestered and savage of all the Dravirian tribes. Blunt described them as large and well made men, equal in stature to his Hindustani sepoys, and very black. Their native arms are the bow and arrow, hatchets and spears. The wilder hordes subsist chiefly on jungle roots and fruit, and are generally without clothing or houses. All the independent communities are predatory and ferocious.

The second class comprises two small tribes, the Male, or people of the Rajmahal hills which form the north-east extremity

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of Gondwana, and the Uraon, originally on the Soane, from Rewa to Rhotas, but now located to the southward and apparently surrounded by Kols. The dialects of these two tribes are connected. They have a large and distinct Dravirian basis, but with so considerable an engraftment of Tibetan words that it is evident they must, at one time, have had a close and prolonged intercourse with Tibetan or Tibetoid tribes.

The third class comprises the Sonthal and other Kol tribes. These tribes have a wide range. They are chiefly found in eastern Gondwana, from the Rajmahal hills where they march with the Malè, to within 50 miles of the Mahanadi where they march with the Khonds. To the west Kol villages are found in the proper Gond territory; and beyond its S. W. extremity a tribe found in Berar on the Gawil hills and described as Gonds are really Kols, for their dialect is essentially Kol, although with some Gond and Mahratta ingredients. One of the Kol tribes, the Sonthal, are spread completely across the highlands from Rewah to Cuttack, while on the N. E. they are found in the valleys and skirts of the Rajmahal hills. The aboriginal tribes of Western India from Goa to Guzerat, known as Kolis &c., retain the name and some of the institutions of the Kols. The Kol language is a very remarkable one, and its exact position can hardly be said to be yet decided.* It may be described either as a Tibetan dialect deeply modified by Dravirian, or as a Dravirian dialect deeply modified by Tibetan. The two ingredients are manifestly present, and it is a true hybrid tongue, whichever be considered as the basis. Two dialects recently brought to light, the Savara and Gadaba, belong to this class, and it is probable that some of the wilder Gond villages will also prove to be Kol, like those of the Gawil range. Broken tribes are found in different places in the outskirts of the Vindhya, as the Kar (Karwar) near the Soane, who appear to be Dravirian from some of their words given by Blunt, and the Saurahs, neighbours of the Khonds. Beyond the limits of Gondwana, but in and near the continuation of the same highland tract on the north and west, are found the well known Bhil.

We may infer that, throughout the Tibetan æra of northern India, the Khonds and the Gonds continued to have a purely native or Dravirian environment, and never came under the influence of the Tibetan tribes. From the great extension of the Kols right across the Vindhyan highlands from north to south

* But see p. 66, 75.

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and from east to west, the character of their language and its influence up to the borders of China, it is probable that they were, at one time, the principal Tibeto-Dravirian people of northern India. It may further be surmised that when they became weakened by the progress of the Arian dominion, the Gonds were able not only to oppose their further progress to the south, but to advance within their territory and break them up into separate divisions. The Male and Uraon, the Savara and Gadaba, do not owe their Tibetan ingredients to Kol alone, otherwise it might have been supposed that the Tibetoid tribes were for the first time driven in among the Gonds by the advance of the Arians.

[April 1858.]

THE ETHNOLOGICAL RESULTS OF DR. LIVINGSTON'S AFRICAN EXPLORATIONS.

It would be too late, even if it were not presumptuous, to offer our readers any general notice of Dr. Livingston's Travels, after the work has been reviewed in almost every English paper. The missionary's character—simple, earnest, robust and determined—his geniality and observation, give a sustained power and charm to his homely and graphic descriptions of African scenery and life. He reminds us of the older and less literate race of travellers, and the minuteness and loving fidelity of his pictures of animals and plants are almost worthy of Dampier. With little of the roving voyager's imagination, he has the singular advantage of complete familiarity with the native tribes of the territory he describes, and a mastery of one of the principal languages. The most barbarous people are always found, on close acquaintance, to be possessed of much knowledge of the climate and vegetation, and of the habits of the fauna, of the country occupied by them; and the traveller who enters into their ideas is sure to obtain many valuable and curious facts, amid the mass of puerile and superstitious notions with which their repertory of science is stuffed. Immense as are the additions which Dr. Livingston has made to our knowledge of the interior of southern Africa, the traveller himself is, for the time, the greatest object on the map, and we follow his steps with a constantly increasing admiration of the man. His journeys were a prolonged battle not merely with all the ordinary difficulties, hardships and dangers which beset pioneers in barbarous countries, but with the misery and prostration of sickness. We must place him even before those explorers of the N. W. passage who have suffered most, for he voluntarily and singly encountered certain disease and probable death. He is the most indomitable and one of the most sagacious in that long roll of geographical explorers who have gained as much fame for the English race as the colonies we have planted. The light which his labours have thrown on the physical geography of Africa has been universally acknowledged, and Sir R. Murchison, Mr. Macqueen and other scientific men have shown how it affects our previous conceptions of the

character of the interior of the southern peninsula. What was formerly matter of induction or speculation is now certainty. A bold generalisation of Murchison's has become an observed fact. The water-shed between the great rivers of the east and west coasts—the Zambesi and the Congo—is not a lofty snow-covered mountain chain, but a shallow lake, from the two extremities of which the water flows in opposite directions. Southern Africa is thus an island in the Arabic sense. A similar phenomenon, on a small scale, is found in the south of the Malay peninsula, where the Rio Formosa and the Indau drain the same marsh, so that, in the rainy season, a canoe might be paddled across the Peninsula from sea to sea.

The ethnological results of Dr. Livingston's journeys do not appear to have been specially noticed, like the geographical and geological, and we shall therefore draw attention to a few of them. All eyes are now attracted to his return journey up the Zambesi and Lieutenant Burton's attempt to reach Lake Maravi from Zanzibar, and it will be useful to glance back at our knowledge of that branch of the South African tribes among whom their routes will lie. We may first briefly indicate the most recent views that have been taken of African ethnology as a whole.

The Caucasian, Semitic and African languages have a common primary basis, and the two last constitute one family. The African division has two main branches which have been termed the Libyan and the Zimbian. The former is closely connected with Semitic. Its best representatives are Hottentot and Egyptian; but most of the northern and many of the middle languages are mainly Libyan. The Zimbian branch, in its purest condition, comprises all the known languages of Africa south of the Line or within one or two degrees north of it, except the Hottentot. On the N. W. it extends into the middle region along the coast and far over the Niger-Chadda province. In the N. E. a Libyan group, the well known Galla-Saumali, has a strong Zimbian element. In the Nilo-Nigerian zone a sub-formation, which has been termed the Nilotic as it is most strongly marked in the Nubian of the upper Nile, presents some peculiarities of a Scythic character, and its influence is traceable westward to the Mandingo group. From the number of distinct Scythic words in the vocabularies, it is possible that this sub-formation was induced by a real incorporation of an invading Scythic horde from Arabia with Abyssinian tribes, at a period when the African languages had not become flexional. But as the Semito-African and Caucasian alliance, when considered as a whole, shows the same primitive oscillation between a postpositional and a prepositional structure that appears in Hima-laic, N. E. Scythoid and American, and as Scythic words are

found abundantly in all the peninsular lines of language that radiate from Upper Asia, it is most probable that, in its basis, the Nilotic sub-formation is simply a very archaic variety of the Semito-African family. Lastly, the western Semitic languages, in all their later stages, have influenced the North African. The Zimbrian branch is very broadly distinguished from the Libyo-Semitic by its present form. It is greatly more agglomerative, luxuriant and complex, but it is now almost demonstrated that the Libyo-Semitic groups are not so much imperfectly developed, as impoverished and concreted, forms of the same archaic type. To those who are only familiar with such a family as the Indo-European, it is difficult to convey a correct idea of these larger and older families, which, while single in basis, have been more richly and variously developed.* The Semito-African family, while one in roots and ultimate structural tendencies, embraces several sub-families, the members of each of which have the close and special relationship of the Indo-European languages. The relationship that subsists between the Chinese, the Tibeto-Burman and the Mon Anam tongues presents many points of resemblance. From ages long anterior to history the Chinese have stood apart from the ruder western tribes of the family, who are separated from them by difficult masses of mountains. The improved race has sought out and influenced its more barbarous neighbours, but has been very slightly influenced by them in return. In like manner the Semitic nations have been isolated from the African, but have always played an important part in African history. Much of the Chinese vocabulary, including the numerals, is found in the languages of Tibet and Ultraiidia and in the ancient ones of northern India, but generally in older and more varied forms than the present Chinese dialects possess. Precisely similar is the relationship between the Semitic and the African vocabularies. The Semitic numerals, for example, in their existing form, are but a fragmentary and dialectic remnant of an archaic system much of which is better preserved by African tribes, and which can be restored completely and consistently by a comparison of all the dialectic forms of it now extant. For instance little or nothing can be made of 7 in the Semitic *sa.ba-ta*, *se.ba-t* &c, (whence our "sabbath" and the "saptu" of our Malay friends) and the Zimbrian *sa.mba*, *ta.be* &c., except that they have a certain degree of resemblance to each other, which becomes closer when the Semitic masculine suffix is removed. But other African dialects show that the word is compounded of 5 and 2,—e.g. the Ndob *sa.mbe* is from *sa.n* 5 and *mbe* 2, the Yagwa *to-mva* from

* See p. 92.

nto 5 and mva 2, the Mfut ta be from nta or ta 5 and be 2,—and some of the Zimbrian still use the ancient uncompounded and unconcreted names, those of the tribes near the estuary of the Zambesi having such names as *m-za.na zi vi-ri*, *ta.nu na be.li*, literally “five and two,” *ta.nu 5*, and *be-li* &c. 2, retaining the archaic postfixes, while the Mosambique *tha.na*, *za-na* like the Chadda *dsa-n*, *tsi-n*, *se-na* &c. illustrate the oscillation between *t*, *d* and *s*, *z*. When the Hebrew and Arab race first colonised Africa it must have had similar names, and the change from *za.na zi vi-ri* (*ba-ri* &c. in other dialects) to *sa.ba* is the phonologic measure of the chronologic interval between the Kafir and the Arabic forms of speech, and possibly also of the physiological departure of the Kafir man from the Arab or the Arab from the Kafir. In the same manner the Peguan, the Karen and the Wikir numerals preserve the Chinese in older and fuller forms, and carry us back to a period which was ancient when Yu drained the swampy basin of the Yellow River. When we turn to the structure of the various groups that compose the great eastern and western families of the Old World, a range of differentiation is perceived which amazes and perplexes the orthodox ethnologist of the Berlin and London schools. He is called upon to admit an identity in roots, even to the pronouns and native numerals, as absolute as in English and Sanskrit, with a variance in structure greater than that between Turkish and Greek. In this respect the Chino-Himalaic and the Semito-African families present the same kind of facts. Our systems must expand with our knowledge. We cannot force the Siamese, the Tibetan and the Chinese—the Syriac, the Bornui, the Sechuana and the Hottentot,—into moulds of the Indo-European dimensions. But they have a close family agreement nevertheless, and there is no more reason that every large linguistic alliance, should have the same limits of agreement and divergency, than that every fixed star should be a counterpart of the solar system, or that every family of plants or animals should be restricted to precisely the same range of variation. The truth is that the definition of the word family is inconstant even when applied to the Indo-European brotherhood. It meant one thing when English had not diverged more from the Sanskrit type than Greek has. It means another thing when English has lost most of the ancient flexions. It means one thing to those who admit Bengali into the circle, and another to those who, in doing so, mark it with a bar sinister, or who exclude it altogether. What it may mean at the end of the next thousand years when all the living languages may have changed as much as they have done within the last millennium, no grammatical prophet can foretell. The truth is that the ethnologist has to deal with genealogies. There

may be a real kinship between groups of tribes, although the consanguinity of every two dates from a different generation. The Indo-Europeans, at various removes backward, may enter into the same family with the Scythians, with the Caucasians, with the Semito-Africans, with the Dravido-Australians, with the Americans, with the Tibetans and Chinese. It is in every case and at every step a pure question of genealogy. The links cannot be discovered by any less humble and painful method than a patient comparison of facts, but when found, our technical words, which are but the working symbols of the day, must accommodate themselves to our enlarged knowledge by receiving a larger meaning.

Dr. Livingston's journeys have lain exclusively within the southern portion of the Zimbrian area. The coast tribes were more or less known, from the eastern Zumbi (Suaheli of the Arabs)—who, in about $1^{\circ} 30' N.$, succeed the Saumali, an E. Nilotic tribe—to the eastern Mpongwe of the Gabon, whose dialect of pure Zimbrian connects the great southern family with the languages of the Guinea coast and the Niger.

The southern division of the Zimbrian, consists of three principal groups of tribes,—(1) the so called Kafir of the S. E., known to the Chuanas as Matebele or Makon-kobe, speaking three dialects, the Kosah, the Zulu and the Fingoe,—(2) the Chuana,—and (3) the Damara. The Kafir tribes occupy the eastern belt of the continent nearly up to the Zambesi. Several coast tribes of a more negro character, whom they appear to have preceded, are now subject to them. The coast dialects are imperfectly known, but they are all Zimbrian. The eastern Chuana succeed them, the southern tribes under Moshesh being termed Ba-Suto and the northern Ba-Koni. The Chuana tribes do not extend to the southern extremity of the continent like the Kafirs. Their most southern limit is considerably to the north of the Orange River. Their northern extension and distribution were unknown prior to Dr. Livingston's researches. The western Chuana are the tribes in and near the Kalahari desert. The Damara, who have recently been well described by Galton, occupy a tract to the N. W. of the desert. They are succeeded by the Western or Kongo-Mpongwe division. The eastern division, ranging from the Zambesi to Barawa ($13^{\circ} N. L.$) in the Saumali territory, consists of coast and insular tribes whose dialects are more or less known. They are more closely related to the Kongo than to the southern division. The inland tribes, with the exception of some within 50 to 400 miles of the coast, whose vocabularies have been obtained, are very imperfectly known, no European having explored the interior; but from the affinity between the dialects of the opposite coasts, it is probable that the inner ones are embraced in the same relationship.

When southern Africa was first colonised by Europeans, the S. W. division, from the Kei river on the east as far up the west coast as 23° S., was occupied by the Hottentots. Physically they differ not only from the Zimbians but from all the other tribes of Africa. Their dialects prove that they have only recently become neighbours of the Zimbians, for they are purely Libyan, and are much more closely related to Egyptian and even to Hebrew than to Zimbian. The languages by which the chain of connection between Hottentot and its sister Libyan tongues north of the Sahara, was maintained, appear to have been obliterated in the gradual progress of the Zimbians. The Hottentots may have migrated southward from age to age to escape conquest and destruction, or they may have been found by the Zimbians in their present locality after extirpating all the more northern tribes of the ancient race. It is not even certain that the Zimbians were the first people whose migrations restricted the Hottentots to the extreme south. One thing is clear; they separated from the northern stock at a most remote period. The language preserves Semito-Libyan in an older stage not only than Arabic or Hebrew, but than most of the north African tongues, excepting Egyptian. Where the Hottentot tribes march with the Kafirs a mixed border race has been produced, speaking Kafir. On the other hand where they march with the Damaras on the N. W., one branch of that people have adopted Hottentot. The two languages have mutually influenced each other in a small degree. Kosah has adopted clicks and a number of Hottentot words.

The continuity of the great South African or Zimbian family has been found by Dr. Livingston to prevail, without any break in the interior, throughout the Zambesi basin. He nowhere met or heard of any remnant of an older people like the Hottentots of the extreme south. A comparison of dialects had led ethnologists to infer that the northern tribes on the Atlantic and Indian oceans were more recently and closely connected with each other than with the southern branch. Dr. Livingston's observations confirm this. The northern tribes retain the highly developed shamanism and fetishism of middle Africa and ancient Asia, with most of the specific Asiatic superstitions and observances by which its progress may be traced. The southern tribes belong to a migration which left the main stock before the old Asiatic religion was received into the basin of the Nile, or which has fallen away from it and returned to a simpler and more primitive creed, during its long separation. Dr. Livingston appears to consider the Zambesi as marking this ethnic division. It will probably be found that the extent to which the influence of the Arabs has penetrated, is limited in the same way; and that the trading spirit—which

shows itself in greed and rapine in the earlier, as well as in all corrupt, stages of civilization—has been chiefly fostered by them.

The Kafirs and other Zimbrian tribes inhabiting high localities have a somewhat Iranian or Indian appearance. The subject coast tribes have much more of the negro character. North of the Zambesi the Makua and Suaheli are also negro, but less so than the Guinea negroes. From native accounts and the testimony of the Portuguese who have penetrated to some distance inland, it is known that those of the eastern highlands resemble the Kafirs in appearance and civilisation, while those of the low middle region beyond are more negro and barbarous.

Dr. Livingston has determined the northern limit of the Chuanas and the southern one of the Kongo tribes of the interior. Until very recently the Chuana do not appear to have extended beyond the Kalahari Desert. Its N. E. extremity separated them from the Zouga which flows northward into Lake Ngami. The inner basin of the Zambesi, including Lake Ngami, was in the possession of the black tribes of the northern branch, with the exception of the Kafir or Matebele tribe under Um-zele-kazi (in Se-Chuana, Mo-sili-katse). A chief named Sebituane was driven from Kuruman with a small body of Ba-Tuto followers in 1824. After many vicissitudes of fortune in the northern part of the Be-Chuana country, he crossed the desert and conquered the first of the northern tribes, the Ba-Metli of Lake Kumadan. He gradually extended his conquests over the tribes on both sides of the Zambesi generically known as the Makalaka,—the Ba-Toka, Ba-Thubia, Ba-Nyeti, Ba-Rotse or Ba-Loi-ana (little Baloi). The ranks of the dominant Ba-Tuto had been swelled by additions from the conquered Be-Chuana tribes, and after their establishment on the Zambesi, Makalakas were largely adopted into the tribe of the conqueror, which is known as the Mokololo. The Makalaka group of dialects is a branch of the Kongo, and allied to the most southerly coast dialect, the Bunda (p 218). The Mambari of Bihe who belong to the Am-Bunda family, visit the Makalaka to purchase slaves. They are as black as the Ba-Rotse. The Makololo sway ends at Libonta, 15° N. As usual in Southern Africa, an uninhabited border land succeeds, in which the main branch of the Zambesi, flowing from the eastward, is joined by the Leeba from the N. W. The lower basin of the main branch is occupied by Ba-Rotse, not subject to the Makololo. Beyond 14° the great inland country of Londa commences. It extends from the Leeba and Casai, the most easterly upper branch of the Zaire or Congo river, over about 6 degrees of longitude. The chief is called Matiamvo [Muata ya Nvo], and the state of Ka-Zembe, placed by Dr. Livingston between 26° and 30° E. Long., and

10° and 11° N. L., is subject to him. According to the Portuguese and Arab authorities collected by Mr. Macqueen, 26 provinces, including those of Ka-Zembe, are subjected to Muata ya Nvo. His empire appears to extend over five degrees of latitude (about 5° to 10° S.) and ten of longitude (20° to 30°). It is succeeded by the territory of No-ropoa or Mo-lua, which embraces the next 5° of latitude up to the equator. Frequent wars take place between the two central states. To the east of them lies the country of Mono-Moezi, including the great lake of Taganyika. E. and N. E. of this territory are found the Nika, 3° to 5° S., much nearer the coast,—the Sambara, 4° to 6° S. and 100 miles from the coast,—the Kamba 40 miles inland,—the Pokomo, 3° or 4° S., subject to the Galla,—the Chaga or Jaga to the S. of them around the snow capped Kilimanjaro,—the Hiau, N. E. of Lake Nyassa or Maravi,—the Maravi on the Lake,—and the Moviza to the eastward of them. The leading coast tribes are the Suaheli from 1½° N. to Mozambique, and the Makua thence to the Zambesi.

Dr. Livingston corrects the notion that the typical African physique is of the degraded negro character popularly ascribed to it. He divides the southern promontory into three irregular zones. The eastern is mountainous, and hence moist, well watered and wooded. The Zulu tribes (Ama-Zulu) who inhabit it are "tall, muscular and well made, shrewd, energetic and brave; altogether meriting the character given them by military authorities of being 'magnificent savages'. Their development and form of skull show that, but for the black skin and woolly hair, they would take rank among the foremost Europeans." The middle division consists mostly of arid and undulating plains, the few hills are low, streams and springs are rare, and long droughts occur. It is inhabited by the Chuana tribes (*Be Chuana*), whose physical and moral development is inferior to that of their eastern brethren. The western division is more flat and dry than the middle one, and the great Kalahari desert forms a part of it.

The central tribes of the north, the Londa, as well as those to the east of them, are more "negro" than the Kafirs. The Ba-Londa "are real negroes and have much more wool on their heads and bodies than any of the Be-Chuana or Caffre tribes; they are generally very dark in colour, but several are to be seen of a lighter hue." "The Ba-Toka of the Zambesi are generally very dark in colour, and very degraded and negro-like in appearance, while those who live on the highlands are frequently of the colour of coffee-and-milk." The men wear no clothing at all. Dr. Livingston says, in other place, "The dark colour, thick lips,

heads elongated backwards and upwards and covered with wool, flat noses, with other negro peculiarities, are general; but while these characteristics place them in the true negro family the reader would imbibe a wrong idea if he supposed that all these features combined are often met with in one individual. All have a certain thickness and prominence of lip, but many are met with in every village in whom thickness and projection are not more marked than in Europeans. All are dark, but the colour is shaded off in different individuals from deep black to light yellow. As we go westward we observe the light colour predominating over the dark, and then again when we come within the influence of damp from sea air, we find the shape deepen into the general blackness of the coast population. . . . With every disposition to pay due deference to the opinions of those who have made ethnology their special study, I have felt myself unable to believe that the exaggerated features usually put forth as those of the typical negro, characterise the majority of any nation of south central Africa. The monuments of the ancient Egyptians seem to me to embody the ideal of the inhabitants of Londa better than the figures of any work of ethnology I have met with." (p. 378) "The people who inhabit the central region are not all quite black in colour. Many incline to that of bronze and others are as light in face as the Bushmen: who, it may be remembered, afford a proof that heat alone does not cause blackness, but that heat and moisture combined, do very materially deepen the colour. Wherever we find people who have continued for ages in a hot humid district, they are deep black, but to this apparent law there are exceptions, caused by the migrations of both tribes and individuals; the Makololo, for instance, among the tribes of the humid central basin, appear of a sickly sallowness when compared with the aboriginal inhabitants; the Ba-Toka also who lived in an elevated region, are, when seen in company with the Ba-Toka of the rivers, so much lighter in colour, that they might be taken for another tribe; but their language, and the very marked custom of knocking out the upper front teeth, leave no room for doubt that they are one people. Apart from the influences of elevation, heat, humidity and degradation, I have imagined that the lighter and darker colours observed in the native population run in five longitudinal bands along the southern portion of the continent. Those on the sea board of both the east and west are very dark; then two bands of lighter colour lie about three hundred miles from each coast, of which the westerly one bending round, embraces the Kalahari Desert and Be-chuana countries, and then the central basin is a very dark region. This opinion is not given with any

degree of positiveness. It is stated just as it struck my mind in passing across the country, and if incorrect, it is singular that the dialects spoken by the different tribes, have arranged themselves in a fashion which seems to indicate migration along the lines of colour. The dialects spoken in the extreme south, whether Hottentot or Caffre, bear a close affinity to those of the tribes living immediately on their northern borders; one glides into the other, and their affinities are so easily detected, that they are at once recognized to be cognate. If the dialects of extreme points are compared, as that of the Caffres and the tribes near the Equator, it is more difficult to recognize the fact, which is really the case, that all the dialects belong to but two families of languages. Examination of the roots of the words of the dialects arranged in geographical order, shows that they merge into each other, and there is not nearly so much difference between the extremes of east and west as between those of north and south; the dialect spoken at Tete resembling closely that in Angola."

Dr. Livingston is in error as to the prevalent opinions of ethnologists respecting the typical African physique, which is Indian more than Guinea, and has even suggested the idea that the Africans and ancient Indians were primarily derived from the same province in South Western Asia. "A glance at the variable physical character of the African tribes shows that the peculiarities in the Dravirian physical type, when compared with the Scythic, are African and Africo-Semitic. The very exaggerated occipital and maxillary projections are not characteristic of the typical African head, but of a debasement of it confined to certain localities. Several East and Mid African nations have the so-called African traits much softened, and differ little from the Dravirians. Even woolly or spiral hair is not universal, some tribes having fine silky hair. The Dravirian pyramidal nose, the sharp depression at its root, the turgid lips, the oval contour, and the beard, are all African."*—"The typical East African head, or that which is removed both from the exaggerated prognathous form prevalent among the Guinea negroes and the highly Semitic form characteristic of tribes that have been deeply crossed by Arab blood, is, in some respects, intermediate between the Iranian and Turanian, while it has specialities of its own. In certain of the higher [Dravirian] castes in which the complexion is fairer, an Egyptian style of features is not infrequently observable. In this the nose is not indented at the root. It is long and slightly curved; the eyebrows are delicate and deeply curved;

* Ethnology of the Indo-Pacific Islands Part II. c. 5.

the eyes almond-shaped and somewhat oblique; and the chin is short. In general, however, the physiognomy is more Iranian than the E. African and Egyptian."* The African and Dravirian types are allied to the Iranian more closely than to the Turanian, and this physical approachment is in consistency with the geographical distribution of these great branches of the human family. The Africo-Semitic languages are highly Caucasian, and their original fount must have been S. W. Asiatic. The Dravirian family has a Caucasian element and appears to have also come from the same quarter. In the later stages of ancient Asiatic history the Iranians were paramount in the same province. All these southern forms of language have a Turanian basis; but they have also special affinities, indicating some connection at a period subsequent to their excommunication from the central Scythic family. The Semito-African family has the most varied and idiosyncratic development, and thus appears to have segregated the earliest. The Iranian takes the next place, as the Turanian basis, both structural and vocabular, has a more Scythic character. Dravirian is the most Scythic of all, and would thus appear to have maintained a close connection with the Scythic family to a comparatively late period.

The effect of a change in locality or in the mode of subsistence, is seen in the Ba-Kalahari, who are believed to be the oldest Be-Chuana tribe of the south. The tradition is that they were formerly rich in cattle, but were despoiled of them by a new swarm, and driven into the Kalahari desert among the aboriginal Bushmen. The latter are nomadic hunters, and prey on the herds of game, which they follow in all their wanderings. The Ba-Kalahari continue to practice agriculture and rear goats under all the difficulties of their present home, and their coarse and precarious food has degraded them in person and mind. They have often the thin legs and arms and protruding abdomens of other tribes in this condition, and the timidity induced by their physical wretchedness helps to aggravate it by exposing them to the rapacity of other tribes.

Dr. Livingston does not furnish any connected view of the native customs, but several are incidentally noticed.

Each Be-Chuana tribe has a tabooed animal, from which its name is derived. This is a very ancient Asiatic custom, and is still preserved by Siberian, American and Australian tribes.

The poison ordeal is practised to the N. of the Zambesi, as in Madagascar.

It is believed that the souls of the dead mingle with the living,

* *Ib.*

and seek to take them away. The slayer makes a sacrifice to appease the spirit of the slain, "buang badi" of the Malays. Sickness is attributed to the influence of the spirits, and fowls and goats are sacrificed to them (p. 434). Persons may cause death by incantations; and charms are used for protection against them (440).

Among the Ba-Nyai the chief is elected, and the son of the deceased chief's sister is preferred to his children. This is an ancient custom still found among many tribes, and it probably originated in the desire to make certain that the blood of the family flows in the veins of the chief.

Among the southern tribes, beyond 20° S., boys on admittance, at adolescence, into the rank of men, undergo circumcision. Three of the tribes follow it by a severe flagellation which sears the back with wounds and weals. The rites of circumcision are carefully concealed. Three of the tribes have additional initiatory rites. Every six or seven years all the boys, from 10 to 14 or 15 years old, are enrolled as the companions for life of one of the sons of the chief. They are taken to a secluded place where dancing and other manly accomplishments are beaten into them. Each of these bands (mepato) takes a distinctive name, as Matsatsi, the suns, Ma-bu-sa, the rulers. In lieu of circumcision the Ba-Toka of both sexes knock out the upper front teeth at the age of puberty. Initiatory virile rites, including severe tests of courage and endurance of pain, were universal in the archaic Asiatic civilisation, and like the other customs of the ancient world are now chiefly to be found among those tribes that early wandered to regions beyond the influence of the later civilizations, Chinese, Indo-Persian, Semitic, Egyptian.

The common Ba-Londa mode of salutation is by taking up sand and rubbing it on the shoulders and upper part of the arms (276). A more refined and polite method is to bring some ashes or pipe-clay in a piece of skin and rub it on the chest and upper front part of each arm. Some drum their ribs with their elbows, others touch the ground with one cheek after another, and clap their hands. The Ba-Toka throw themselves down on their backs, roll from side to side and slap their thighs, *more Andamannorum*. (55).

Deformed infants are generally destroyed by the Ba-Londa. Some tribes also kill children and animals for certain eccentricities, called tlola (transgression), e. g. a child who cuts the upper front teeth before the under,—one of twins,—an ox which beats the ground with its tail while lying in the pen,—a cock that crows before midnight (577). In the same spirit among the Crwato Ba-Man and Ba-Kwain a man who is bitten by an alligator or has water splashed over him by the animal's tail is expelled from the tribe. A bite from a zebra is also a cause of expulsion.

At one part of the Zambesi the women pierce the upper lip and insert a shell (577).

All the northern tribes (20° *et supra*) sacrifice men to deceased chiefs. Human sacrifices are practised, and certain parts of the body are used as charms (588).

Cannibalism was practised until recently by some of the Be-Chuana of the Maluti range.

The large wooden mortars and pestles used by the Makololo and Makalaka for pounding maize are identical with those of the ancient Egyptians (195.) The mode of spinning and weaving practised by the Central tribes is also similar to that of the Egyptians. The hair is dressed by some in the Egyptian mode, plaiting it into cords hanging to the shoulder. [*June 1858.*]

NOTES ON BUDDHISM IN CEYLON AND SIAM.

The following notes have no pretence to profundity or erudition, and several learned works on Buddhism having already appeared in France and England, little could be said that is not already contained in those works. As those works are not easily accessible, a slight sketch of Buddhism in Ceylon and Siam may be acceptable to the readers of the Journal of the Eastern Archipelago, and if the Journal have any readers among the Ceylon planters, the most elementary sketch would increase their present stock of information, which can barely distinguish Buddhism from Hinduism.

Buddhism in Ceylon and Siam is the same, and it differs in an essential point from that followed in Tibet, which is the form most familiarly known in Europe through the relation of the Revd. Father Huc. He tells us that in Tibet and Chinese Tartary there is always a living Buddha or incarnation of Buddha upon earth, who on his death is succeeded by another selected by the priests and known to them by certain signs. This the Ceylon Buddhists reject entirely; they say that there has been no other Buddha since Gautama Buddha, the fourth Buddha; and they say that there can only be one Buddha at a time.

Gautama or Sakya-muni, called by the Siamese Somano-khodom, was born 543 years B. C. in India, and though he was the first of the Buddhists, still there is good reason for not considering him as the author of the absurd mass of contradictions contained in Buddhism. The Buddhists deny the existence of any Supreme Being, or Creator; they say that the world has always existed, and that men came into it of their own accord, or of themselves, yet they maintain that a man's good or bad actions will influence his position in the next life. When asked, how so, if there is no Judge? they say that a man's actions will be like the weights in a scale, but they cannot tell who holds or who placed the scales.

Their idea of the highest happiness to be attained after death is expressed by the word "nirwana" which means literally extinction as of a candle. What this means, the priests do not like to say; the common people do not know at all, and say the priests do not know anything more about it than themselves. I could not find out that the formula "Hum mani padmè hum" used in Tibet, or any equivalent for it, was in use among the Singhalese.

The priests will admit that Gautama Buddha and Sakya-muni were the same person, but if then pressed to say how a man like Sakya-muni could lay down laws, whilst they deny the existence of a Supreme authority that could have commissioned him to do so, they will back out of their admission in the best way they can. The best way to account for the numerous contradictions in Buddhism would seem to be found in the fierce wars carried on after the death of Sakya-muni by the Hindus against his followers, and which ended in their being totally vanquished, and expelled from Hindustan. The enmity against the Brahmins produced by their persecutions would be enough to induce the Buddhists to reject everything Hindu, which they did blindly, leaving themselves without any foundations. It must also be remembered that Sakya-muni's sayings were not collected and written down till very many years after his death.

In one temple in Ceylon I received an answer from a priest differing from the usual Buddhist belief and statements. I had asked him how men came upon earth, he answered Brahma Raja brought them down out of heaven. I then asked what had become of Brahma. His answer was singular and showed an anti-Hindu feeling—Brahma being the Hindu name for the Creator. "What do I know," said he, "whether he is alive or dead; when one sees a cocoanut tree who can tell what has become of the first cocoanut tree?" He then pointed out the picture of Brahma on the wall of the temple; there were three figures side by side; I asked who the other two were. "It is all Brahma", he said; and how did he become three? "By his own choice and will", was the priest's reply. In spite of the inherent contradictions of Buddhism very few converts to Christianity are made in Ceylon or in Siam; in Ceylon many pass for Christians and are only found out to be Buddhists at their deaths or when seized with illness when they will send for a Buddhist priest. I heard of a Buddhist priest having gone to a missionary school and having stayed there a year, and the missionaries thought that they had converted him, but at the end of that time he resumed his priests yellow robes, and took leave of them, saying, "What you have taught me is very beautiful, but what we have got ourselves is much better." One reason that the Buddhist

priesthood maintain their ground is that their lives are very pure and blameless, this is said with regard to Ceylon.

It is a general opinion among the Europeans in Ceylon, that is to say of the official or educated portion of them, that the Buddhist priests and religion are very tolerant. I am inclined to attribute very much of this tolerance or indifference in Ceylon to the motive of race and not creed, for the Singhalese are a remarkably mild race, and in Siam where the opinions and doctrines are the same, the priests are arrogant and overbearing.

Another thing in which I noticed a difference between the two countries, is that in Ceylon the temples are much more frequented by the people, and offerings of flowers are constantly placed upon the shrines of the idols; whilst in Siam, the temples are for the most part shut, and have the appearance of being neglected and abandoned by the people. The Siamese temples contain a great number of little images brought there as offerings, the Siamese common people do not show any respect for the idols and break or steal them frequently enough, though there is a severe law against idol-stealing. Several of the Siamese temples have been repaired and regilt and others are in process of reparation through the care of the present King who was himself a priest for several years. The temples in Siam do not possess land as in Ceylon. The temples in both countries are frequently overshadowed by the *ficus religiosa*. The leaves of this tree in Siam do not end in a curve as in Ceylon, but in a long point. This tree is an object of veneration to the Buddhists because Gautama Buddha found rest and shelter under it. The late mission to Burmah say that at all the theatrical representations a tree or image of a tree was placed in the back ground, perhaps it might have been this sacred tree. In Ceylon the chief priests and persons of importance are burned after death, in Siam burning is the general way of disposing of the dead, and the funeral pyres of the great are very costly; there is a very horrid exception to this practise in the case of poor persons, whose bodies are exposed near some of the temples to the dogs and vultures; in some cases the priests cut up these bodies into pieces for the convenience of the vultures. The Chinese, of whom there are great numbers in Siam, suffer very much from these customs, they have got no burial ground, and are often hard pressed for the disposal of their dead.

There is a curious custom in Ceylon similar to that which exists in Tibet. Before arriving in Ceylon I had never heard or seen any mention of its existence in that island. It is that of polyandry, one woman marries two or more husbands, usually brothers. The greatest number of husbands I heard mentioned was seven. This custom, sanctioned by Kandian law, is, I was informed by a priest,

opposed to Buddhism. Lately several of the more respectable Singhalese had petitioned Her Majesty to abolish this custom, and to assimilate Kandian to English marriage law ; the petition received the royal assent, and this custom is now legally at an end. It's origin is probably simply owing to motives of economy ; two brothers inheriting a piece of land only just sufficient for their maintenance would marry one woman in order to limit the number of their children to the number that the land could maintain—a kind of compromise with Malthus. Some times curious suits took place in cases of inheritance, for instance supposing two brothers each married a wife and each had a son, and that then the wife of the younger brother died, the younger brother would then marry his elder brother's wife : and if a son were then born, this third son having two fathers would inherit the half of the property of each, and would so get a half of the whole original property, leaving a quarter only to each of the two elder sons. As in Tibet the children talk of their different fathers as their big father and their little father. I saw a family of this kind the different members of which seemed to be living in perfect harmony, as I was informed is usually case. The next day I saw something which astonished me almost more than this singular custom, and that was a planter who had been living sixteen years in the island, and up to that moment had been ignorant that the custom existed. Nothing of this sort is to be found in Siam, and it is presumable that poverty alone has produced this monstrous arrangement both in Ceylon and Tibet.

HANDBOOK
FOR
COLONISTS
IN
TROPICAL AUSTRALIA

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A Handbook for Colonists in Tropical Australia, by GEORGE WINDSOR EARL, Member of the Royal Asiatic Society, and Corresponding Member of the Ethnological Society of London. Formerly Commissioner of Crown Lands at Port Essington, North Australia.

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INTRODUCTION TO THE "HANDBOOK."

THE arrangement of these notes for publication has not been altogether a labour of love. But it happened that during my official connection with Port Essington, which lasted from the first formation of the establishment in the year 1838 until within a few months of its abandonment in December, 1849, the chief duty assigned to me was that of collecting information which might prove useful to colonists in the event of the settlement being thrown open to private enterprise by the sale of Crown Lands. A portion of this information, more immediately relating to commerce, navigation, and the resources of neighbouring countries, has already been published, but I was permitted to withhold the details that could be interesting only to pastoral and agricultural settlers until a prospect arose of their being turned to a practical use. That time has at length arrived, the stock stations of the Queensland colonists having extended northward nearly to the parallel of the head of the Gulf of Carpentaria, while a movement has taken place which looks like a general advance along the whole line of southern colonies into the Tropical Region;—and my friend Mr. J. R. Logan having placed at my disposal the columns of the *Journal of the Indian Archipelago*, I can no longer plead any reasonable cause for hesitation. My materials are arranged in the form of a "Handbook," as being most convenient for reference, and at the same time best suited for keeping the Author strictly within the bounds of practical utility. I think it will be found to contain every well ascertained fact relating to the Tropical Region that is likely to prove acceptable to colonists, who may rest assured that these facts have been recorded without the slightest inclination on the part of the writer to make matters appear more favourable than they really are.

GEO. WINDSOR EARL.

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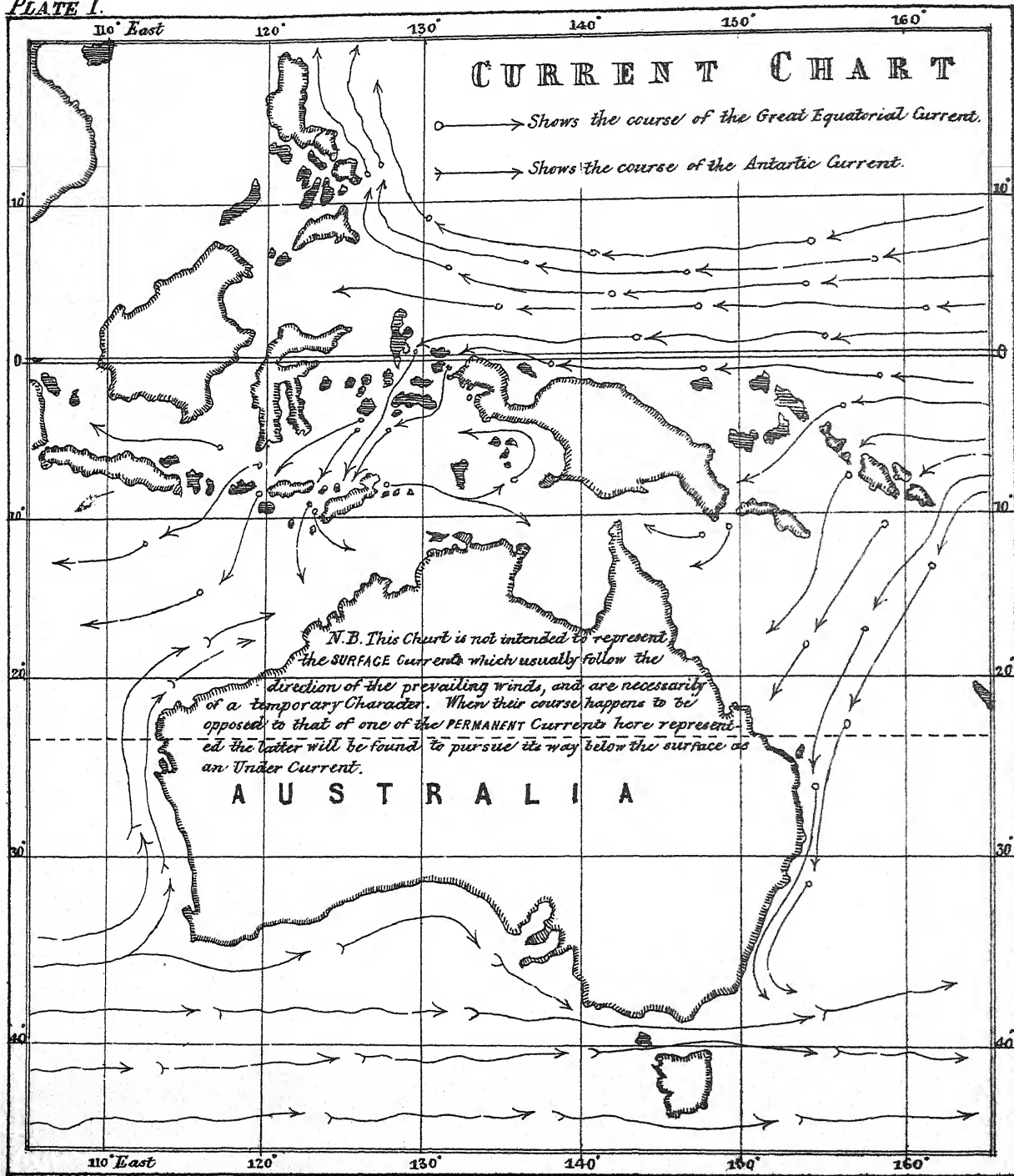
HANDBOOK &c.

PART I.

GEOGRAPHY.

SECTION I.—WINDS, WEATHER, CURRENTS, TIDES AND TEMPERATURE.

- „ II.—VICTORIA RIVER AND DISTRICT.
- „ III.—NORTHWEST COAST FROM VICTORIA RIVER
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SECTION I.

WINDS, WEATHER, CURRENTS, TIDES, AND TEMPERATURE.

THE TRADE-WIND—INTERRUPTIONS ON THE N. W. COAST—LAND AND SEA BREEZES—NORTHWEST MONSOON—THE COOL SEASON—THUNDER-STORMS—THE HOT OR ELECTRICAL SEASON—HURRICANE SQUALLS—CYCLONES—THE PORT ESSINGTON HURRICANE—WEATHER DURING THE NORTHWEST MONSOON—INFLUENCE OF THE N. W. MONSOON ON THE HOT WINDS OF THE SOUTHERN PARTS OF THE CONTINENT—THE EQUATORIAL OR GREAT TROPICAL CURRENT—THE GUT OF TIMOR—SOUTHERN BRANCH OF THE EQUATORIAL CURRENT ON THE EAST AND NORTHEAST COASTS—INFLUENCE OF THE EQUATORIAL CURRENT ON THE TIDE LEVEL—TEMPERATURE.

WINDS.—The tropical region of Australia is situated within the limits of the Southeast Trade Wind, that is to say, the Trade Wind would blow throughout the year with little interruption, as is the case within the same latitudes in the Indian and Pacific Oceans, if the space occupied by the continent of Australia were open sea. Indeed on the Northeast coast, which is quite open to the Trade Wind, it blows without intermission, except during the months of December, January, February, and March when spurts of westerly wind are occasionally experienced, this being the season in which the Northwest Monsoon prevails in the Java and Molucca Seas. On the North and Northwest coasts the Trade Wind blows steadily only during the months of May, June and July, after which it becomes interrupted by the rarefaction of the air in the interior of the continent, which ascends

and forces upwards the Trade Wind, the latter, however, still continuing its course overhead, and striking the water again at a distance of two or three hundred miles from the coast. On the Northwest coast, the vacuum thus created is supplied by a current of air curving round the N. W. Cape and forming a sort of westerly monsoon which blows with little interruption during August, September and October. This westerly wind extends as far as Melville Island and Van Diemens Gulf, and was occasionally felt at Port Essington, although the latter place lies more within the influence of the system which affects the Gulf of Carpentaria and the North coast from Melville Island to Cape Wessel. Here the Trade Wind does not altogether cease during the months of August, September and October, but appears in the form of a strong land wind during the night and early morning, which is succeeded by a sea breeze from northeast blowing late into the evening; while at some distance from the land the wind is steady at East. During November, and sometimes later, the winds are variable, when a change of the moon brings the first spurt of the Northwest Monsoon, which often blows with great strength for ten days at a time, with heavy rain-squalls following each other in rapid succession. If the rain has been very heavy, and has extended far inland, the Southeast Trade Wind often springs up as soon as the N. W. wind has ceased, and blows a light but steady breeze until the next change of the moon brings another burst of northwest wind and rain. The last of the Monsoon is generally felt in March, but spurts of short duration are occasionally experienced as late as April, when the Southeast Trade-Wind reasserts its supremacy.

WEATHER.—The weather during the season in which the trade wind blows is perfectly delightful:—cool, clear, and the atmosphere possessing an elasticity that elevates the spirits in an extraordinary manner; the inland districts, when the country is open, being more enjoyable than the coast. In the interior, however, the cool weather terminates rather abruptly some time in August, the precursor being a calm, hot day, followed by a thunder storm at night, after which the trade wind may continue for two or three days more, when another calm, hot, day occurs, with much lightning towards the afternoon; and the same weather may continue for several days until another thunder storm breaks over the spot and affords a temporary relief. The hot, or electrical season has now fairly commenced in the interior, and the lightning is almost incessant in one quarter or another. The coast region, at least from the Victoria River eastward, is comparatively little affected by these thun-

der storms, land and sea breezes alternating until the Northwest Monsoon commences, but to the *westward* of the Victoria, where the interior is apparently more desert, the amount of electricity generated is enormous, and a large portion enters the body of the Trade Wind which is passing overhead, and strikes the water to leeward, perhaps at a distance of 300 miles from the land with a violence so great, that the American whalers who frequented the coast at this season before the new fishing grounds near Behring's Strait were discovered, named them "Hurricane Squalls". They are of the same character as the famous Sumatra squalls of the Strait of Malacca, and are caused by the same phenomena, but are much more violent and dangerous. There are strong grounds for inferring that these "Hurricane Squalls", or rather that phenomena of a similar but more violent character occurring later in the season, are not only the precursors, but actually contain the embryo of the cyclones of the Southern Indian Ocean commonly called "Mauritius Hurricanes" from their curving to the Southward in the neighbourhood of that island. These cyclones are often experienced as far to the eastward as the south coasts of Java and Bali.

With the exception of the thunder storms, which are a beautiful provision of nature for supplying the interior with moisture during the hot season, and thus saving the vegetation from being utterly burnt up and destroyed, the continent itself appears to be little affected by the enormous amount of electricity generated within its bounds. This is accounted for by the electricity, or at least the greater portion of it, being carried off by the Trade Wind, as stated above. Australia, however, is not altogether exempt from hurricanes, as strips of forest are occasionally met with in the interior where the trees have been blown down and thrown across one another in a manner that can only be effected by a cyclone. Still there is only one well authenticated case of the centre of a cyclone having ever even touched the coasts of the continent, namely the Port Essington hurricane of November 1839.* This hurricane originated in the South Pacific Ocean, probably far to the eastward, where the cyclones of the South Pacific system are generally first felt, and whence they pass to the westward near the Navigator and Fiji groups, and then curve to the southward between New Zealand and the east coast of Australia; the storm wave and sometimes the outer circle of the cyclone itself being felt at Sydney and Moreton Bay. The Port Essington Hurricane must have strayed from the usual course of these cy-

* "Nautical Magazine" for 1840. Stokes' *Voyage of H. M. S. Beagle* vol. II p. 99.

clones and have passed through Torres Straits, as it was met with in that neighbourhood by the expedition under Commodore D'Urville, the ships of which sustained some damage. After desolating Port Essington, it passed to the westward between Timor and the N. W. coast of Australia, as its effects were felt both at Kopang and at the Victoria River* beyond which it has not been traced. Further details on this subject would be unsuited to the purpose of this work, but when the Law of Storms of the Southern Hemisphere comes to be written, Australia will furnish an interesting and instructive chapter.

The Northwest Monsoon, which may be looked for towards the close of the year, brings a change in the weather. When the Monsoon is strong, which happens usually at intervals of three years, it sets in with a fresh breeze and heavy rain-squalls, and advances steadily into the interior, thoroughly moistening the surface of the earth. There are also grounds for supposing that it drives the heated air before it, thus causing the hot-winds which affect all the Southern colonies at this season, for it is certain that the hot-winds in South Australia, New South Wales and Victoria are most felt when the Northwest Monsoon is stronger than usual. In milder seasons the monsoon produces little effect far beyond the coasts, indeed the heavier clouds do not appear to rise to a very great height above the surface of the earth, for in some years they are so obstructed by the mountains of Java that the rains do not reach even the south side of that island, on which occasions the northwest coast of Australia gets the monsoon from west to west north-west, but with a diminished amount of moisture. As may be expected, the more heavy and continuous the fall of rain, the steadier and stronger will be the Trade-wind when it resumes its course. The weather is often close and warm during the monsoon, which occurs when the sun is in the southern hemisphere, but this is only during calms, for whenever a breeze blows it cannot but be cooling to the great evaporation. No hot winds, such as those experienced in the southern colonies, where they sometimes blow for several days in succession, has ever yet been felt in any part of Tropical Australia, nor is it likely that any such can occur, at least near the coast, although it is probable that towards the centre of the continent, on the verge of the Tropic, the same influences which cause the hot winds in the southern colonies will be exerted there also.

TIDES AND CURRENTS.—The coasts of Australia are affected by two distinct systems of current, namely the Equatorial or Great

* Stokes, *ubi supra*.

January, February & March.
PREVAILING WINDS.

During the Rainy Season in Tropical Australia.
Shows the direction of the Winds

PLATE II. N.B. The shaded parts indicate the Regions in which Rain is abundant.

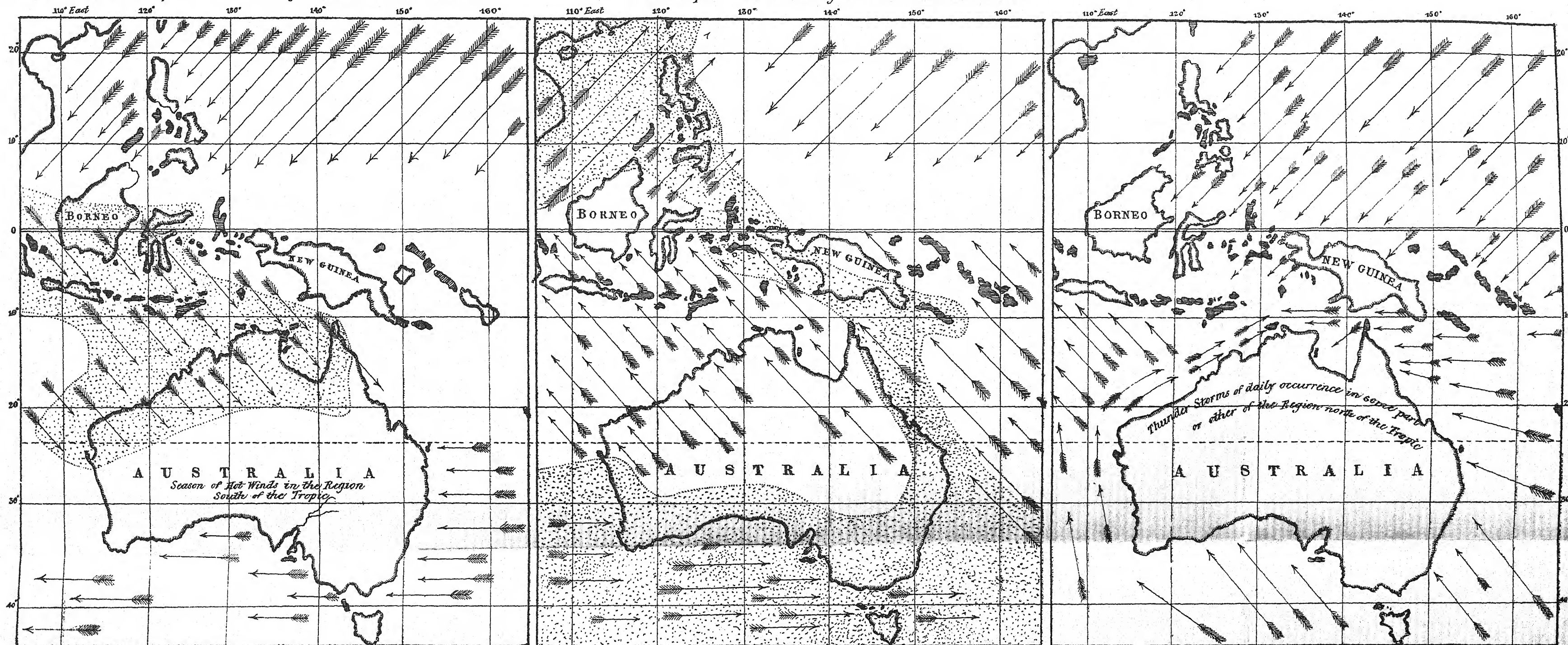
May, June & July.
PREVAILING WINDS.

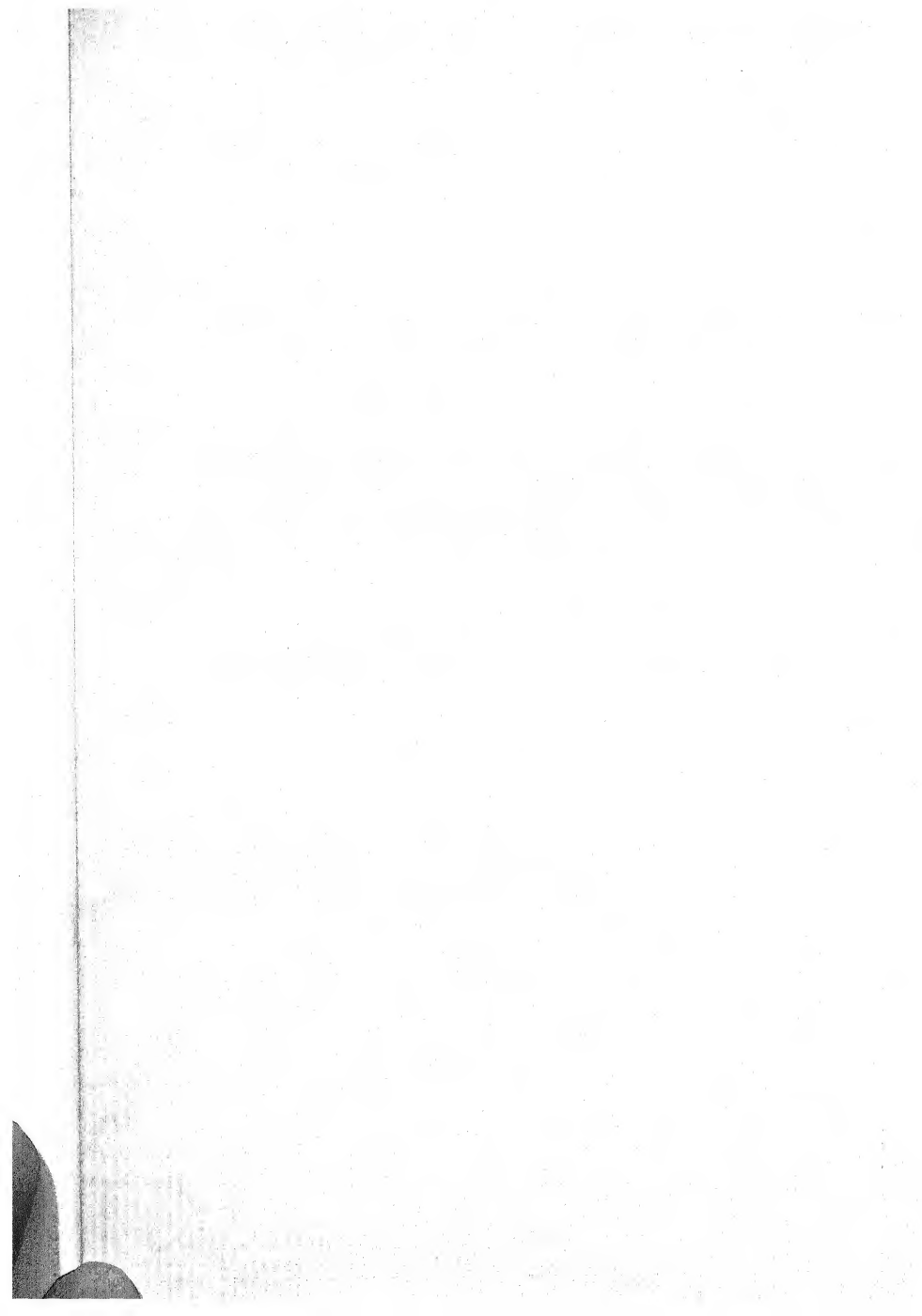
During the Cold Season in Tropical Australia,
Shows the direction of the Winds.

N.B. The shaded parts indicate the Regions in which Rain is abundant.

September, October & November
PREVAILING WINDS.

During the Hot or Electrical Season in Tropical Australia
Shows the direction of the Winds.





Tropical Current of the Pacific, and the Antarctic or South Sea Current, which last sweeps round the Southern Ocean from west to east, following the course of the prevailing winds. The Equatorial Current, coming from the opposite direction, namely the east, also follows the course of the prevailing wind, but it owes its force almost entirely to the rotation of the earth, as is shown by the fact that the strength of the current is as great after the Trade Wind has ceased as when it was blowing in full strength. The westerly course of this current along the Equator is deflected by the island of New Guinea, which directs it to the northward along the western coasts of the Moluccan and Philippine groups whence it curves to the westward towards Japan, being the Kuro Siwo, a sort of "gulf stream" which fertilizes that group, and gives its southern coasts almost a tropical climate. A portion of this stream forces its way through the deep gorge which separates New Guinea from the Moluccas, and precipitates itself on the north coast of Timor, along which it sweeps to the westward, passing through the unfathomable gorge between Timor and Ombay at the rate of between five and six miles an hour.* This current has certain peculiarities. The water seems to be heavier than common sea-water, and has a great tendency to sink, the current being much stronger below than at the surface. It is also charged plentifully with animalculæ, squid, and other marine productions on which the sperm whale delights to feed; indeed the course of the current across the Indian Ocean is very accurately defined by the limits of the "grounds" within which the sperm whale is caught, and which are so distinctly shown in Lieut. Maury's Whale Chart. The northeast coast of Australia is also affected by a branch of this Equatorial Current which passes along the southeast coast of New Guinea, and strikes the Australian coast in the neighbourhood of the tropic, where it divides, one portion passing to the northeast

* A portion of the stream that is precepitated on the north coast of Timor passes to the eastward between Timor and Wetta, and is felt as far east as New Guinea.

The *Surface Currents*, which usually follow the direction of the prevailing winds, are not noticed above, as the details could only prove useful to navigators. As a general rule, a surface current will be found to exist whenever a breeze has blown steadily for two or three days in succession, but the permanent current, as shown in the accompanying Chart. (*Plate I.*) will be found running a few fathoms below the surface as an under current. At the southern entrances of the Gut of Timor and of the narrow unfathomable straits east of Java, this under current causes a heavy swell from the southwest, having much the appearance and character of a long ground swell.

through Torres Strait or back along the south coast of New Guinea, and the other forming a southerly current along the coast of Australia until it is thrown off by the opposing Antarctic Current. The latter is more of a surface current than the former, being caused by the prevailing westerly winds in the Southern Ocean, but for this reason it is more sensibly felt by navigators, and indeed seems to form the tidal wave throughout the entire coast of the continent, excepting that portion which lies between the Victoria River and Torres Strait.

The rise and fall of the tide is no where very great except in the neighbourhood of those parts of the coast upon which the Equatorial Current is precipitated. At Camden Bay on the northwest coast in Lat. $15^{\circ} 30'$ S., the rise and fall experienced by Captain King was thirty seven feet and a half, which is the greatest observed on any part of the coast. At Port Darwin, near Van Diemen Gulf, more than 300 miles to the westward, the rise and fall during springs is 24 feet; and altogether there is upwards of 500 miles of coast in this Northwest region on which dry docks available for ships of the largest class could be constructed without the aid of pumping machinery. On the northeast coast the tides rise very nearly as high as on the northwest coast, 35 feet being the limit at Broad Sound in Lat. 22° S., but the extent of coast acted upon scarcely exceeds 60 miles, as might be expected, indeed, from the diminished body of Equatorial Current which strikes on the northeast coast. Upon the whole, the tropical coasts have an advantage in this particular over the coasts to the south, as there is no part of the north or northwest coast in which the rise and fall during springs is less than 9 feet, while beyond the tropic it is never greater than 6 feet, and very rarely more than half that amount.

TEMPERATURE.—Port Essington is the only spot in Tropical Australia where the range of the thermometer has been registered throughout the year. There the maximum was 97° and the minimum 63° , the former occurring in the month of November and the latter in June. The thermometer was kept in a low building with the floor raised 5 feet above the ground, walls of weather-board, and roof of shingle, or split casuarina wood. Had the thermometer been kept in a building of the same construction as the common dawk bungalow of India, the maximum would have been at least four degrees lower. The settlement where the observations were made was on the shore of the inner harbour, 18 miles from the sea, and on some days the sea breeze altogether

failed to reach it, so there was a disadvantage on this point also. I am satisfied that on any part of the coast accessible to the sea breeze between Melville and Wessels Island, the maximum would very rarely if ever be above 90° in an attap bungalow, such as is used by Europeans in Java and the Straits. On the Northeast coast, the maximum is likely to be two or three degrees lower under similar circumstances with regard to shelter, and the minimum may also be somewhat lower, but this is a doubtful point. In the interior, and on coasts less favourably situated with regard to the seabreeze, the maximum will be at least 10° greater or about 100° ; but on the other hand the minimum will be from 20° to 30° lower. On the banks of the Victoria River the thermometer once fell as low as 40° , and Sir Thomas Mitchell experienced severe cold, (the thermometer below freezing point) while close to the tropic during his last expedition from New South Wales in the direction of the Gulf of Carpentaria. There can be no doubt that those who have to go abroad during the hot season will be exposed to a severe degree of heat, calculated to produce a large amount of discomfort, although it may not be injurious to health; for at Port Essington our kangaroo hunters, generally noncommissioned officers of Marines, were exposed almost daily during the hottest season of the year to long continued exertion on foot;—nevertheless they were always the healthiest men in the garrison.

SECTION II.

VICTORIA RIVER AND DISTRICT.

PRELIMINARY REMARKS—VICTORIA RIVER MOUTH—ENTRANCE ISLAND AND
THE SANDSTONE GORGE—POINT PEARCE—TURTLE POINT—CAMBRIDGE
GULF—THE UPPER VICTORIA—STURT CREEK—THE SALT LAKE—STUART'S
FOREST—NEWCASTLE WATER—TIMBER OF THE VICTORIA—THE DROOPING
TEA-TREE—THE MANGROVE—FISH AND GAME—ADAPTATION FOR PASTORAL
PURSUITS—COTTON—THE DATE PALM—THE COCONUT—THE NIPA PALM—
MARKETS FOR HORSES AND CATTLE—INDIA AND THE MAURITIUS—PASSAGE
TO INDIA—TO THE MAURITIUS—TO JAVA AND BALI—INDIAN LABOURERS.

The Victoria River, in the northwest, appears destined to become the site of the first permanent settlement established on the northern coasts of Australia. Ten years ago the chances were in favour of some port in the Gulf of Carpentaria taking precedence on this point, a practicable route from New South Wales having been traced by Dr. Leichhardt during his memorable overland journey from Moreton Bay to Port Essington, which the colonists engaged in pastoral pursuits were preparing to follow up by transporting their surplus horse-stock by the overland route to the Gulf for shipment to India ;—but the discovery of gold near Bathurst put a sudden stop to the enterprise by furnishing a far better market nearer home, which soon enabled many of the larger stock-holders to retire with ample fortunes. The separation of the northern or Moreton Bay district from New South Wales, and its establishment as an independent colony under the name of Queensland, which occurred a few years afterwards, turned the attention of the older colonists to matters more exclu-

sively local, and the settlers in the new colony naturally became absorbed in extending their territory along the coast towards Torres Straits, which they might claim as their own whenever a new colony came to be opened further to the north, an event that must inevitably happen sooner or later. The field was therefore left open to the colonists of South Australia, who indeed, had been the first to adventure upon it, the well-organised expedition under Eyre, which resulted in the discovery of the so-called Lake Torrens having been fitted out in 1839, only three years after the founding of the colony. This was followed up by the great central expedition under Capt. Sturt, which may be considered as the precursor of the late success, Mr. Stuart, the discoverer of the route to the N. W. coast, having been the follower of Capt. Sturt on his last expedition, and has since been almost constantly occupied in exploration to the northward. The occupation of the country along the line of route is already progressing and a party has set out with stock to traverse the route of Mr. Stuart in the endeavour to find shipment on the Victoria River for the South of India;* so that its permanent settlement will merely be a question of time.

It may seem strange that I should anticipate success to the unaided efforts of a small body of colonists when no less than three unsuccessful attempts have been made by the Supreme Government itself to establish settlements in the same region, with the last and greatest of which I was myself connected; but the matter admits of easy explanation. A colonial establishment can never be considered permanent until it is supported by a body of colonists who have become so interested in its success that its abandonment would prove their ruin. In the case of Port Essington it was hoped that the difficulties connected with the question of cotton supply in England, which were even then acknowledged, would prove sufficient to enlist the support of the home manufacturers, at least until experiments in cotton culture had been fully carried out;—but this proved a mistake, as even that small encouragement was withheld which would have justified the government in throwing the land open for colonization.

VICTORIA RIVER MOUTH (Lat. 14. 40 S. Long. 129. 25 E.) is upwards of 20 miles wide between Turtle Point and Swamp Point which form the mouth of the river. A portion of this space is occupied by mud and sand banks, the first lying near the coast,

* See "Proceedings of Royal Geographical Society" of London Feby. 11th, and Novr, 25th 1861.

10 *Queen's Channel—Victoria River—Entrance Island.*

and the sand banks forming long ridges towards the centre of the river, running in the direction of the stream of tide, and bounding the central channel on either side. This channel was discovered and surveyed by the officers of H. M. S. *Beagle* in the year 1839, and named the Queen's Channel. The entrance from seaward is between two sand-heads, a mile and a half apart, which are covered at half tide, the depth in the channel being 7 and 8 fathoms, which however, decreases farther up; but as there is still $2\frac{1}{2}$ fathoms at low water, and the rise and fall of tide at full and change of the moon is 24 feet, there is a depth sufficient for the largest ship. The great strength of the tide seems likely to render this channel unpopular except under very favourable circumstances, the ordinary rate being 5 miles an hour, and the velocity of the ebb tide must be greatly increased during the freshes. Under these circumstances the two eastern channels, through one of which H. M. S. *Beagle* entered are likely to be preferred, for although more narrow and tortuous, the tides are very strong only at certain spots which can easily be avoided by ships requiring to anchor to stop tide. The land at the mouth of the river is uniformly low, consisting of islands or mud flats overgrown with mangroves and partly covered at high tide. Point Pearce,

the north extreme of the bay into which the river discharges, is visible in clear weather from the sand-heads, distant 17 miles, the cliffs being 85 feet high. The Macadam Range, 600 feet high will also be visible 18 miles to the westward, but it is less valuable as a leading mark for making the sand-heads than Point Pearce. River Peak, on the north bank of the river near the commencement of the narrows, may also generally be seen distant 25 miles to the south-west.

ENTRANCE ISLAND AND THE SANDSTONE GORGE.—The low land, mud flats, and sand banks terminate suddenly at Entrance Island, thirty miles from the sand-heads, where the river contracts to a width of less than a mile, and rushes through a gorge in the sand-stone range with a velocity that creates numerous eddies and whirlpools which render the navigation critical, although the depth of water is great, sometimes as much as 20 fathoms. H. M. Ship *Beagle* passed through this gorge, which is ten miles in length, and anchored in

HOLDFAST REACH, where some wells were sunk on the north bank of the river, and a plentiful supply of good water obtained. The *Beagle* remained the whole of the month of November at this anchorage, while the boats were exploring the upper waters of the river. Capt. Stokes says

that she might have gone seven miles further up than Holdfast Reach; and the *Tom Tough* a schooner of 140 tons in attendance on Mr. Gregory's Overland Expedition ascended the river for 100 miles in September 1855, but she was so much injured by repeated grounding on the sand banks that she required extensive repairs before she could be sent to sea, and was condemned as soon as she reached a commercial port. It is not likely, however, that vessels of burthen will ascend the river so high as Holdfast Reach, except with the aid of a powerful steam-tug, for the *Beagle* was turned round and round by the strength of the eddies while passing through the narrows, and although the risk was not very great in a handy vessel of 200 tons with a numerous and disciplined crew, it would be otherwise in the case of a modern clipper ship, whose length and capacity would render her unsuited for this kind of navigation. Nor does the anchorage at Holdfast Reach present any attractions beyond the wells of fresh water, as the two anchors with which the *Beagle* was moored bit so deeply into the ground owing to the strength of the tide (sometimes $6\frac{1}{2}$ miles per hour) that they could not be weighed, and had to be left behind with a portion of their cables. This anchorage also seems to have been oppressively hot, pro-

bably owing to the radiation from the Red Sandstone ranges as the thermometer on board the *Beagle* sometimes stood at 105° in the shade. Capt. Stokes thus records the departure of the *Beagle* from Holdfast Reach. "December 1." We slipped from our last anchor at daylight and proceeded down the river. After pirouetting through Whirlpool Reach, we got as far down as the flats fronting River Peak, above which we anchored near noon. After having been shut up among rocky ranges for a month, the sight of the sea horizon was a novelty, and the cool, refreshing breeze, as it came sweeping over the unbroken expanse of waters, created in us very pleasing sensations." (*Voyage of the Beagle*, vol. II. p. 103.) This spot, namely the end of Sea Reach, close up to the entrance of the narrows, may be looked upon as the site of the future port, as it will certainly become the anchorage for all ships of burthen frequenting the river, that is to say unless some other spot very favourably circumstanced happens to be discovered. Fresh water will be found in abundance below the surface at the base of the sandstone ranges, and the supply of fuel will come from the mangrove jungle which lies to seaward; indeed so scant of timber are the banks of the river further inland that when

the population comes to be large, the mangrove wood, which furnishes fuel of the best description, is likely to be in general use up to the head of the navigation.

POINT PEARCE.—(Lat. $14^{\circ} 25'$ 50 " S. Long. $129^{\circ} 21' 42''$ E.) which forms the north point of the great bay into which the Victoria flows, is a small headland composed of red sandstone cliffs 85 feet high, covered with a growth of timber, mostly white barked eucalyptus. The cliffs rise abruptly from a shelf of rocks very little elevated above high water mark, round which the tide rushes with great rapidity, forming a race which extend upwards of a mile out to sea, although the depth of water close in to the point is four fathoms, rapidly increasing to seaward. The rise and fall of the tide at the springs is 26 feet, and it is high water at full and change at seven o'clock. There is a bay to the South of Point Pearce in which a ship can anchor out of the strength of the tide in 5 to 6 fathoms. Ships bound to the Victoria River by the Queen's Channel will have to make Point Pearce, from which they can shape their course for the sand-heads. There will probably be a pilot station established here when the banks of the river come to be settled, and establishments for cutting timber are likely also to be formed, as wood is much more abundant here than nearer the

river. Lieut. Stokes of H. M. S. *Beagle* was wounded by a spear thrown by a native from the cliff while he was taking observations on the shelf of rocks below, but the natives did not make their appearance when the horses for Mr. Gregory's expedition were being landed, although there was evidence of their being in the neighbourhood. They were probably alarmed lest the Europeans should retaliate, for as aggressions of a similar nature are never forgotten by themselves, but are handed down by tradition from generation to generation, they must naturally suppose that the same spirit exists in strangers.

The country in the neighbourhood of Point Pearce is well grassed, and there is water for stock in lagoons a short distance inland, even in the driest season.

TURTLE POINT the south extreme of the river's mouth, is a cluster of low sand hills, backed by mangrove jungle, extending inland for several miles. The ship channels, on this side have not yet been surveyed. If they prove to be of good depth, which is at least probable, they are likely to be preferred to the northerly channels, as the tides run with a greatly decreased velocity on this side, a point which navigators will appreciate. There is a creek within the point in which pilot schooners, or even vessels of a much

larger class, could obtain shelter from all winds.

CAMBRIDGE GULF, sixty miles to the eastward of Turtle Point, is a navigable inlet penetrating inland upwards of sixty miles in a southerly direction. It was discovered and surveyed by Captain King during his first voyage in the *Cumberland* cutter. The entrance between Cape Domett on the east, and Cape Dussejour on the west, is 12 miles wide, the centre part being occupied by a rocky, barren island, six hundred feet high and nine miles in circumference, called Lacrosse Island, so named by the French expedition under Captain Baudin. The western channel is rather more than five miles wide, but half of this space is occupied by a reef extending from Cape Dussejour. The eastern channel appeared to be clear throughout, and Capt. King had seven fathoms half a mile from the eastern side of the island. The depth in the western channel is greater, as he had no bottom with fourteen and seventeen fathoms when passing the island at the distance of a mile from the shore. The *Cumberland* anchored in a sandy bay on the south side of the island half a mile from the shore. No fresh water was found here nor in any other part of the Gulf, and very little timber was seen except the mangrove. The port, however may prove useful to a

vessel bound to the Victoria River making the coast during one of the spurts of strong westerly wind which sometimes occur in the months of December, January, and February, when it may be considered advisable to await better weather before running for Point Pearse. The coast is clear to the westward of the Gulf as far as Cape Londonderry, ninety five miles distant; and Mount Casuarina, a conspicuous flat-topped hill thirty five miles to the westward of Cape Dussejour, which may be seen at a distance of seven or eight leagues when between the bearings of South and W. S. W., is an excellent leading mark.

It should be mentioned that Captain King saw every indication of fresh water being abundant on Lacrosse Island during the rainy season.

A few natives were seen by Captain King on Lacrosse Island and on the shores of the Gulf, but they avoided intercourse with their visitors.

UPPER VICTORIA RIVER.—Above Holdfast Reach the river opens out and to an average width of $1\frac{1}{2}$ mile, and the tortuous character that marks its passage through the sandstone gorge disappears, for now there is a reach of 16 miles in length running south, when the river takes an abrupt turn to the eastward and the country immediately improves, the valley extending for some distance

from each bank in flats of brown loamy soil, scantily wooded with *Eucalyptus* and *Melaleuca*. This easterly trend continues for 25 miles, when it bends to the S. E. across the Whirlwind Plains of Stokes for 10 miles, and then runs south 5 miles to the site of the Camp established by Mr. Gregory as a depot while he was absent on his trip towards the S. W. to the sources of the Victoria and the Salt Lake. This may be considered as the head of the navigation of the river, for a little beyond the channel is dry or nearly so at certain seasons of the year. The *Tom Tough* ascended to this point when the waters of the river were at the lowest, so that whatever discussion may arise as to the most convenient position for the port, there can be no difference of opinion as to the point to which goods can be carried by water at all seasons of the year.

Above the Camp, the bed of the river becomes tortuous up to a point 50 miles due east, when it curves to the southward, and continues in that direction up to its source, which was found in a sandstone table land, 1200 feet high, in Lat. 18°, Long 130° 40'. This tableland proved to be the dividing range, running N. W. and S. E. It was subsequently crossed by Mr. Gregory and his party at a point 50 miles to the northeast while on his journey towards

the interior. The dividing range was 1700 feet in elevation at the second point of crossing. The region of the upper Victoria consists chiefly of extensive valleys of good soil, well grassed, the sandstone of the lower region being varied with outcrops of basalt, limestone, and jasper. Mr. Wilson, the geologist of the expedition, in his paper on the Physical Geography of N. W. Australia published in the Journal of the Royal Geographical Society, says:—"In no part of the world have I seen grass grow so luxuriantly, and Mr. H. Gregory observed to me during a journey of ten days, when I accompanied him and his brother to the Upper Victoria, that he had seen more grass land than during all his life before." (*Vol. XXVIII* p. 141.) This beautiful country is, however, liable to floods, sometimes rising to an enormous height in contracted valleys, so that settlers will do well to examine narrowly the level of former floods before erecting their stations. These floods do not appear to be caused by the regular monsoon rains, but rather by water-spouts or such like phenomena during the periodical commotions that take place in the atmosphere of this region.

Mr. Gregory and his party were at the Victoria River or in the immediate neighbourhood

from Sept. 15th 1855 to the end of June in the following year, a period of more than nine months, including the hottest season of the year. Mr. Elsey, the surgeon of the expedition, who resided constantly at the Camp, gives the following particulars of the seasons and climate in his Medical Report, which is published in the volume of the Geographical Society's Journal quoted above, (p. 136). "As far as our observations extended, there seem to be three seasons in Northwest Australia, viz: the wet season, commencing about December and lasting to February; the spring or cool season, from March to July; and the dry or hot season, from August to November. Our first arrival at the Victoria was in September. The whole country was parched, the vegetation dried up, and bush-fires were frequent. The heat of the day was not followed by a cool night. Though the maximum heat was not excessive, rarely exceeding 114° Fahr., the minimum was very high, seldom falling below 80° at any time, and I have known the Thermometer suspended in the air to stand 98° at sunrise. During these months there was scarcely any dew. Lightning was constant to the E. and N. E. and was rarely absent for six months. There were occasional thunder storms during the month of October."

* * * *

"The rains commenced towards the end of November, and by the middle of December had fairly set in. On the 18th the freshes had raised the river some 4 or 5 feet. From the 20th to the end of December the rain was incessant, and on the 7th of January the river was 11 feet above its average level. This was the greatest height attained. There were, however, indications of its being a very dry season. The weather during this time was very oppressive, and the excessive moisture rendered the heat most trying to the party, many of whom were actively employed. By the end of January the rain had almost entirely ceased, and at the end of February, the air had regained its usual dryness."

"From March to July there was a constant succession of beautiful weather. The noonday heat seldom exceeded 95°, and was tempered by a delicious S.E. breeze, which blew uninterruptedly for nearly 5 weeks, and, with slight intervals, for four months. The days were bright and cloudless, the nights clear and cold, the thermometer generally below 50° at sunrise, and sometimes below 40°. The weather had a most beneficial effect on us, and its influence was specially felt by those of the party who were for so long a time resident in camp, at one spot, and without any active employment or exercise."

Notwithstanding this cool season, the climate will not seem highly attractive to Europeans, but experienced bushmen will not hesitate to face it, with an important object in view. A better description of dwelling than a tent will reduce the temperature within doors very considerably, but certainly those whose business lies with the shipping will prefer residing on the seaward side of the Entrance Range, where the westerly breeze blows almost continuously during the hot season in the interior. But notwithstanding the height of temperature at the camp the general sanitary condition of the party appears to have been good. The only ailments experienced were an irritable state of the stomach, which yielded to quinine, and a disorder of the eyes which lasted usually for twelve hours, and may have been caused by contact with insect or vegetable poison. Mr. Elsey was able to report that "There was no case of diarrhoea or dysenteric affection, no rheumatism, nor any injury arising from the very considerable exposure to which we were unavoidably subjected."

We will conclude this notice of the Upper Victoria with an extract from Mr. Wilson's paper already quoted, giving a description of the available country in its neighbourhood.

"The soil on these plains (the jasper plains of the Upper Vic-

toria) is a rich clay, frequently very deep, and is derived from the decomposition of the shale rock after being left bare by the removal of the sandstone. The limestone frequently protrudes, and in such localities the soil is more calcareous. Trap plains occur in the higher part of the table-land. This rock is generally of more recent date than the sandstone, and seems to have flowed over depressions, or hollows, worn out of the latter. It is extensive on Roe Downs, occupying 60 miles from E. to W. and computed by Mr. Gregory to extend over a million of acres. The jasper plains contain about 320,000 acres; Beagle Valley, with valleys adjoining 160,000; and the extensive valley of the Norton Shaw and Saunders Rivers it would be difficult fully to estimate, but there appeared under my own observation an extent exceeding 1,500,000 acres, to which, if we add the fine country at the head of Sturt Creek and that at the head of the River Fitzmaurice, they will make an aggregate of 5,000,000 of acres. These tracts have come under our united observation, and may all be considered well-watered pasture land." * * *

"I have said that N. W. Australia is a grassy country, and this character is due, not only to the great abundance of grass with which it is covered, but also to the luxuriance

and variety of the grasses. A few of these, however, are predominant, and in most instances afford excellent pasture. Perhaps the most extensive is a variety that resembles wild oats, and grows from the height of 3 to 6 feet. This grass attains its greatest perfection on the stony slopes and at the base of the ranges. It grows in many places on the top of the tableland, and on dry gravelly patches. Bordering this grass, but on better soil, another variety growing close and fine, and not often exceeding 3 feet high, might make excellent hay. This grass covers extensive tracts on the plains, and when ripe it is very difficult to travel through on foot, as it lies, broken by the wind and parted from its roots, in a tangled mass, a foot to eighteen inches deep, and clings round the feet and legs while passing through it."

STURT CREEK was discovered by Mr. Gregory during his journey towards the interior from the Victoria. He came upon its sources in Lat. $17^{\circ} 50'$ Long. $129^{\circ} 40'$ soon after crossing the dividing range, and followed it up, to Lat. $20^{\circ} 20'$, Long. $127^{\circ} 30'$, where it ended in a salt lake, beyond which was an impassable desert. The valleys and plains through which the creek runs are well grassed, but very scantily clothed with timber. If a practicable route should hereafter be discovered

from Sturt Creek to the country recently explored by Mr. Stuart, its banks will soon become occupied; otherwise it is likely to remain waste until districts more favoured with regard to certainty of a constant supply of water have been settled.

THE SALT LAKE of Gregory, in which he lost Sturt Creek after tracing it down for nearly 300 miles, is 7 or 8 miles across, and is surrounded by a sandy, barren country. It was dry when Mr. Gregory came upon it, the bed being covered with incrustations of salt, but a channel between it and a smaller lake was filled with salt water. It is of little interest beyond being the limit of Mr. Gregory's exploration to the southwest from the Victoria River.

STUART'S FOREST, which, repulsed that enterprising explorer in his first attempt to reach the Victoria River from South Australia, is a dense scrub or jungle of a tropical character lying about 90 miles to the eastward of Camfield Creek, the chief source of the western branch of the Victoria River, through which a road will have to be cut, an operation that will probably have been accomplished before this is printed. Although a formidable obstacle to travellers in its present state, it is still a most important feature in the geography of Central Australia, where the scarcity of timber threatened to

become a serious inconvenience. Details respecting the character of the timber that constitutes the forest are not available at present, but should they appear before this work is issued, particulars will be given in a supplement.

NEWCASTLE WATER, a lagoon more than 9 miles long, 150 yards wide and 17 feet deep in the middle, was also discovered by Mr. Stuart in Lat. $17^{\circ} 30'$ and Long. $133^{\circ} 41'$, or about 200 miles E. a little southerly from Camfield Creek, a tributary of the Victoria River, and nearly the same distance from the coast of the Gulf of Car-

pentaria in the neighbourhood of Pellew Group. This lake is of greater importance now than it will be when the country is occupied, as surface water, so essential for the use of explorers, becomes scarce soon after the rains have fallen, except in peculiar, and widely scattered localities. Settlers will be able to avail themselves of the contents of the natural reservoirs in the limestone formation, which seem to be the chief receptacles of the rain which falls in the table land between the N. W. coast and the Gulf of Carpentaria.

No single vegetables production has yet been discovered in the neighbourhood of the Victoria of a nature calculated for furnish an exportable article. Timber, usually abundant in new countries, is so deficient in quantity and inferior in kind, that when the country becomes settled, beams and planks for large buildings will have to be imported from other parts of the coast or from abroad. Mr. Gregory's party were enabled to obtain a few logs of the drooping tea-tree for the repair of the expedition schooner, but this tree grows only as a fringe on the brink of the river, and must soon be exhausted, while the timber of the stunted white gum was found to be unsound and useless except for firewood. Under these circumstances the mangrove forests which overspread the low half-drowned lands at the mouth of the river will become of importance. I could never account for the low estimation in which the mangrove is held by the colonist, unless it is owing to the circumstance of its growing in the salt water, which may be supposed to render it inferior. The same prejudices do not exist in Malayan countries. In the province where I now reside several thousand acres, indeed all the available mangrove land, has been bought up at the rate of ten shillings per acre, solely for the sake of the timber. The straight pieces are found to be well adapted for posts and rafters of out-buildings, while as fuel for driving steam machinery the wood is inferior only to coal. Some native fruits, and a plant that was used as a vegetable, were found

by Mr. Gregory's party, but as a general rule the colonists will have to depend on their own exertions for supplies of this kind. The yam and sweet-potatoe seem well adapted to soil and climate. Game of the same description as that found in other parts of Australia was also met with, namely kangaroos, wallabies, duck, quail, and cocatoos, but the emu seems to be scarce. The river does not appear to be well supplied with fish, which, however, are abundant on the coast near the mouth of the river, and turtle will also be found at certain seasons, as the shells of a number of dead turtle were seen at the south point of the river mouth, which received its name from this circumstance.

The colonist will have to depend (in the first instance, at least) solely on the natural grasses to afford him a return for the capital invested, and certainly according to the accounts given there must be sufficient to feed and even fatten a far greater amount of stock than can be brought upon it for years to come, even should the breeding of camels, for which the country and climate are evidently well adapted, be added to that of cattle and horses. It will not be safe to calculate on sheep-farming until the experiment has been tried. Markets will have to be found for the produce, and for the herds that will be driven overland from the older colonies; as the shipment of horses from the Southeast ports must cease as soon as the Victoria River is opened up. This point will have to be taken into consideration at the end of the chapter.

Although pastoral pursuits will naturally occupy the chief attention of colonists in the first instance, attempts must soon be made to produce exportable articles suited for the home markets. The climate is so unsuited for plants requiring regular supplies of moisture throughout the year, such as the sugar-cane, that their cultivation is not likely to be tried; but others, such as cotton and indigo, more especially the former, are well deserving of experiment. It is difficult to conceive circumstances better adapted for the growth of cotton than those presented in the basin of the Victoria; namely, three months of rain, followed by a season of cool dry days and clear dewy nights for four months longer, without the occurrence of atmospheric disturbance to interfere with the development of the pods. The plants will be destroyed by the drought that succeeds the cool season, but this will prove a positive advantage, as it will have the same effect as the frosts in Georgia and Carolina, necessitating the planting of fresh seeds every year, and leaving no temptation to the cultivator to allow the plants to remain in the ground for the chance of a crop the

20 *Victoria River—Capabilities—Markets for Produce.*

second year. This necessity for an annual renewal of the plants has had more to do with the success of American cotton planters than is generally admitted.

Another plant well suited to the soil and climate is the Date Palm, which is now so extensively cultivated in Bengal that no less than 35,000 tons of dry sugar were made from its sap in the year 1857, about a third of which was retained for home consumption, and the remainder exported, after passing through the refineries at Calcutta, partly to Europe, and partly to Australia. The process of manufacture, which I shall describe in another part of this work, is exceedingly simple and inexpensive, and the produce (I mean the dry sugar, before it has been subjected to the refining process) is a good average ration sugar, such as would be highly acceptable for the use of all country stations. The date palm cultivated in Bengal is the same variety as the date palm of Arabia (*Phoenix dactylifera*) but of an inferior description. It is propagated from the seed, and as the Arabian date, containing the seed is an article of commerce, no difficulty will be experienced in obtaining supplies.

Of grain, rice appears to be the only variety that can be cultivated with success, and this is not likely to be grown until the country has become populous. I do not think that the coconut will thrive on the inland side of the Entrance Range, but it will grow luxuriantly if planted along the inner margin of the mangrove belt that lines the coast; and the *Nipa* palm, which contributes so much to the comfort of inhabitants of Malayan countries by furnishing the lightest and most durable thatch known in the east, will propagate itself if once planted among the mangroves where the water is occasionally fresh or brackish. Some details respecting the fruits and culinary vegetables adapted for Tropical Australia, and the localities in which they are most likely to succeed, will be given in a separate chapter.

But the prosperity of the first colonists will depend on the markets that the neighbouring countries present for the disposal of the surplus stock of horses and cattle, and it will be necessary that the ships employed in the transport shall not be chance vessels, merely chartered for the voyage, but vessels owned by the colonists or by their supporters in the parent colony in the south, and fitted expressly for the purpose. Three-masted vessels of 300 to 350 tons burthen will be best suited for the traffic, and this class of craft happens to be the one best adapted for the trade of the older colonies. With vessels of a larger size, the temptation to carry a tier of stock in the hold, on the top of the

ballast, as well as in the tween decks, sometimes becomes too great to be resisted, when the ventilation is destroyed, and the stock will be landed in bad condition, which it is most essential to avoid.

The best markets for horses will be found in Madras and Calcutta, where the demand both for military and private purposes is very great. It is also likely that a large demand will arise in Java, where the horses of the country are too small to furnish remounts for the cavalry and artillery. This island may also prove to be a good market for cattle, as it is not a pastoral country, the waste lands being overrun with dense jungle. Cattle of Indian breed are imported from the neighbouring island of Madura, where the country is more open, but the supply is small. In the first instance, however, the Mauritius will absorb nearly all the cattle that the colonists are able to export, as the South Australians already import sugar in considerable quantities from that island, which will afford a return cargo to the parent colony. There are several other ports in India and among the islands of the archipelago where occasional cargoes of cattle and horses would meet with a sale, but it will not be necessary to allude to them at present.

The first week in September will be the best time for a ship to leave the Victoria River with a cargo of horses for Madras or Calcutta, as she will arrive at the commencement of the cool season, when the horses will soonest recover condition. The passage will last about 5 weeks, as the winds become light towards the end of the season. The N. E. monsoon sets in about the middle of November, but if the ship has to bring back a cargo of coolies or breeding camels from the Coromandel coast, she had better delay sailing on the return voyage until the first week in January, when the monsoon will be more steady, and she will arrive at the Victoria when the rainy season is drawing to a close.

The voyage to the Mauritius should be commenced at the latter end of February, with the first of the S. E. trade-wind, and the passage will be of about the same duration as that to India, five weeks. As the trade wind will prevent a direct passage back, the ships will have to load for one of the southern colonies, and return to the Victoria by way of Torres Strait, which is open at this season.

The most convenient time for a trip to Java will be in the month of July, when Batavia will be reached through Sunda Strait in a week or ten days at most. The return voyage will be along the north coast of Java, when a cargo of Island produce suited for the consumption of the colony, such as coconuts, maize,

yams and sweet potatoes can be obtained at Banyu Wangi in Bali Strait, at Badong, near the south end of Bali, or at Ampanam on the island of Lombok. A ship leaving Bali or Lombok Straits in August or September, by standing to the south across the trade-wind for three or four days, will run into the current of S. W. winds which prevail on the N. W. coast of Australia at this season, and which will carry her to her destination in three or four days more.

The details here given respecting facilities of communication with India, Java, and the Mauritius, apply to all ports on the N. W. coast of Australia from the N. W. Cape to Van Diemen Gulf. Their superiority upon this point to the ports in the Gulf of Carpentaria is far greater than I was disposed to admit before I commenced the present investigation.

It was my intention to conclude this chapter with some particulars respecting the sources of labour available for Tropical Australia, but so many details are required that a separate chapter will be necessary. It will suffice to say at present that the natives of the Coromandel coast, who are much given to emigration, are beyond all comparison the best suited for the Victoria River, whether as keepers of horses, cattle, or camels; or as labourers in cotton or date plantations.

SECTION III.

NORTHWEST COAST FROM VICTORIA RIVER
TO VAN DIEMEN GULF.

PORT KEATS—PATERSON BAY—PORT DARWIN—ADELAIDE RIVER AND
MELVILLE ISLAND.

The coast to the westward of Cape Londonderry abounds in excellent harbours and is rich in marine productions, but the land near the sea is of so sterile a character that it is not likely to be occupied until after more favoured spots have been settled. This enterprise will probably be left to the colonists of Western Australia, who have already extended their explorations in this direction, and as some patches of fertile land were discovered by Lieutenants Grey and Lushington during their expedition towards the interior from Hanover Bay in 1837, it is by no means improbable that tracts of land suited for occupation may be found. This, however, will be a distinct enterprise from the one already on foot, and may not be entered upon for many years, so that it would be best for the present to confine our attention to that portion of the tropical region which will be more immediately influenced by the opening up of the Victoria River.

The Northwest coast from Point Pearce to Van Diemen Gulf is well wooded, and has altogether a hospitable appearance, but nothing has yet been discovered that is calculated to render it attractive to settlers. There are, however, some harbours on the coast which will render it interesting to navigators, and which

24 *Ports Keats & Darwin—Anson & Paterson Bays—Adelaide R.*

therefore deserve some notice. Cliffs of red sandstone are conspicuous throughout this part of the coast alternating with sandy beaches where the land slopes gradually, and with belts of mangrove near the mouths of creeks and rivers.

PORT KEATS, 30 miles north of Point Pearce is a well sheltered harbour which may prove useful to coasters on occasions, but as the shores of the inlet are so low as to be flooded at high water, and there is no timber besides the mangrove, it is not likely to be put to any other use for some time to come.

ANSON BAY, 45 miles north of Port Keats, is a capacious sound, 20 miles across, and clear of shoals as far as yet examined. The shores are low and well wooded, and are so easy of access that the bay will be much resorted to by coasters employed in the timber trade, this being the nearest point to the Victoria River where gum timber can be procured in abundance. Fish are very numerous on this part of the coast.

PATERSON BAY (*Lat.* 12° 30' *S. Long.* 130° 35' *E.*) is a deep narrow inlet, with an inner harbour of deep water curving to the eastward named Bynoe Harbour. The shores are well timbered and easily accessible. Pools of fresh water were found at the head of the inner harbour by the officers of *H. M. S. Beagle* at the end of the dry season.

PORT DARWIN, 15 miles to the eastward of Paterson Bay, is another deep inlet, also well

timbered, the palm tree forming part of the forest on the shores of both harbours. The bamboo is also found here, which would be a point of importance were it not so much more abundant in the Adelaide River, the upper waters of which are only a few miles to the eastward of the head of Port Darwin. There are some peculiarities in the geological character of this neighbourhood that will render it interesting to naturalists.

ADELAIDE RIVER, (*Lat.* 12° 10' *Long.* 131° 15') was ascended by the boats of *H. M. S. Beagle* for nearly 80 miles, the water being perfectly fresh during the last 30 miles; and the survey of the river by Lieut. Stokes showed it to be navigable by vessels drawing 18 feet water for about 50 miles, or to the point where the river water is fresh. The banks are low up to this point, and the country level, spreading out on each side into open plains which appeared to be flooded during the rainy season. Clumps of trees are dotted over the surface of the plains like islands. The mangrove lines the shore in the lower part of the river, but about 35 miles from the mouth, the banks are bordered by forests of bamboo, which continue upwards beyond the

point where the river becomes fresh, the bamboos here attaining the enormous height of 60 to 80 feet. As this is the only spot in Australia where this peculiarly useful production has been found in any great abundance, these forests will of themselves prove sufficient to attract visitors whenever any spot in the neighbourhood becomes settled.

The river abounds in game, more especially water-fowl, and a bird was seen resembling the guinea-fowl in colour and habits, which may prove to be a new variety of Australian game.

MELVILLE ISLAND, which lies at the mouth of Van Diemen Gulf, is nearly 90 miles long, and 40 miles wide at its broadest part. It is separated from Bathurst Island, lying to the west, by a narrow strait leading into the Gulf, which is navigable, but not likely to be used, being very narrow. It was on the Melville Island shore of this strait that an establishment of troops and convicts from Sydney was formed in the year 1824, and was maintained until 1829, when the party was withdrawn, and the stock removed to Raffles Bay, on the Cobourg Peninsula, where a second establishment of the same nature had been formed in 1827. The interior of the island was not explored, as the natives proved very formidable, and never ceased hos-

tilities with the strangers as long as the latter remained. The natives, indeed, are a much more powerful people than any found in Australia, and bear a closer resemblance to the islanders of Torres Strait and the south coast of New Guinea than to the Australians. Although explorations were not carried into the interior, its general character was sufficiently seen to show that it may some time become a valuable settlement, the soil being good and productive, and the timber large and valuable. No visit was made to Melville Island by members of the establishment at Port Essington, although they often passed on the way to Van Diemen Gulf, as the natives of the Cobourg Peninsula who always formed part of such expeditions had great dread of the Melville Islanders, whom they looked upon as strangers of a distinct race; and it was necessary when going in that direction to promise that they should not be taken to the island. Intercourse must, however, have taken place formerly, as the Australians of the Cobourg Peninsula have borrowed from the Melville Islanders a spear of hard wood sharpened at both ends, which is thrown by grasping it near the centre, like the assegghays of the Kafirs. I do not know of any single production of Melville Island that cannot be procured on the mainland ex-

cepting the *bintangor*, a light and tough timber much prized for ship's spars, and which is in general use on board vessels which fit out in the Straits of Malacca.

The superior fertility of Melville Island is probably attribu-

table to its being situated at the point where the periodical east and southwest winds meet, as noticed in the chapter on meteorology. The difference of temperature of the two winds may produce heavy falls of dew if not showers of rain.

SECTION IV.

VAN DIEMEN GULF.

SOUTH RIVER—LEICHHARDT'S DESCENT FROM THE TABLE LAND—VALLEY OF
THE SOUTH RIVER—WEST RIVER—EAST RIVER.

VAN DIEMEN GULF is a magnificent deep-water inlet, 100 miles long and from 30 to 60 wide, so sheltered to seaward by Melville Island, which lies across its mouth, that it has the appearance of a large inland lake. There are two entrances to the Gulf, one to the north, 14 miles wide and clear of dangers, with soundings of 35 to 40 fathoms, and the other to the west, 10 miles wide, and studded with islands and reefs, having channels between them of 7 to 15 fathoms. The most interesting feature of the Gulf is the group of navigable rivers at its head, one of which can be entered at low water by the largest ships, and at a distance of a hundred miles from its mouth is still a fine river, with its sources evidently far in the interior. The entire south shore of the Gulf consists of low level country, very scantily wooded, and is apparently the end of a broad valley running far inland between the great range coming from the southeast which abuts near the east side of the Gulf, and a lower parallel range which terminates in the neighbourhood of Port Darwin.

The Gulf, as far as it has yet been explored, is clear of islands and shoals except at the northeast corner, and the depth of water in the centre is 34 fathoms.

SOUTH RIVER, called Monobar by the natives, is the largest of the group of rivers discovered by Captain P. P. King at the head of the Gulf, and which he named Alligator Rivers from the number of animals so called that he found there, but they are really crocodiles of very much the same character as those found in the Nile. A large low island at the mouth of the river divides the channel into two branches, the eastern of which is the most open, the depth being no where less than 6 fathoms at low water, with a rise of 15 feet at the springs. The sea reach is 9 miles long, and of great width, after which the river contracts to about 150 yards, and the depth increases from 4 fathoms to 7 and 8 fathoms, which continues for another 9 miles and then decreases to the point reached by Captain King, 36 miles from the mouth, where there were two and a half fathoms at high water. The banks, thus far, are uniformly low, only 3 feet above high water level, with flats extending far on either hand, dotted with clumps of trees, among which the palm is conspicuous.

Dr. Leichhardt, during his overland journey struck the river rather more than 50 miles above the point reached by Captain King, coming suddenly upon it from the table-land, over which he had been travelling for many

days. I will extract his description of this event. "Nov. 17 (1844). We travelled four or five miles through Banksia and Melaleuca gum forest, crossed several rocky creeks; and followed down the largest of them; which in its whole extent was exceedingly rocky. The rock was generally in horizontal layers. There were many high falls in its bed, which compelled me to leave the creek and proceed on the rising ground along its banks, when suddenly the extensive view of a magnificent valley opened before us. We stood with our whole train in the brink of a deep precipice, of perhaps 1800 feet descent, which seemed to extend far to the eastward (westward?) A large river, joined by many tributary creeks coming from east, south-east, southwest and west, meandered through the valley; and was bounded by high, though less precipitous ranges to the westward and southwest from our position, and other ranges rose to the northward. I went on foot to the mouth of the creek; but the precipice prevented my moving any further; another small creek was examined but with the same result. We were compelled to move back, and thence to reconnoitre for a favourable descent.*" The descent was not effected until two days afterwards, when a

* *Journal*, &c. p. 480.

practical slope was discovered by which the horses and cattle were led down into the valley, where they seem to have enjoyed the change. "The feed had latterly consisted either of coarse grasses, or a small sedge, which they did not like. But in the valley all the tender grasses reappeared in the uttermost profusion, on which horses and bullocks fed most greedily during the short rest I allowed them after reaching the foot of the slope. The creek formed a fine waterfall of very great height, like a silver belt between rich green vegetation, behind which the bare mountain walls, alone were visible." (*Journal* p. 484.)

The travellers themselves also benefitted by the change, for the river, which pursued its course through fringes of pandanus and the drooping tea-tree, teemed with waterfowl; geese, ducks and teal; while flocks of white and black cockatoos and of the Torres Strait pigeon swarmed among the forest trees. These, with numbers of white cranes and Ibises, must have rendered the scene lively enough, and to crown all the natives soon made their appearance and behaved in a most friendly manner, as a return, we may hope, for the welcome they invariably received during their visits to the establishment at Port Essington, from which the party had obtained a shawl and neckerchief of English manu-

facture and an iron tomahawk. I cannot abstain from making another extract from Leichhardt's journal, date Nov. 26th. "About 6 miles from our last camp, an immense plain opened before us, at the west side of which we recognized the green line of the river. We crossed the plain to find water, but the approaches of the river were formed by tea-tree hollows, and by thick vine brush, at the outside of which noble bouquets of Bamboo and stately Corypha palms attracted our attention. In skirting the brush, we came to a salt-water creek (the first seen by us on the northwest coast) when we immediately returned to the ridges, where we met with a well-beaten foot-path of the natives, which led us along brush teeming with wallabies, and through undulating scrubby forest ground to another large plain. Here the noise of clouds of water-fowl, probably rising at the approach of some natives, betrayed to us the presence of water." (p. 491). In fact Leichhardt's Journal from the time he came upon the South River until he reached the Cobourg Peninsula, teems with paragraphs of the same character. The productive nature of the country is indeed shewn by the large amount of the population, the number to the square mile being far greater here than in any other known district of the continent.

Leichhardt's Journey through this tract of country occurred just before the setting in of the northwest moonsoon, which sweeps up the valley with great force, Melville Island being low, and offering no obstruction to its passage into the Gulf, while the mountains on either side of the valley confine the denser portion of the storm-clouds to its limits. The rain fall is therefore very great indeed during this season, and as the valley is known to extend for a hundred miles inland in the direction of the monsoon, and possibly for at least 50 or 60 miles further, a large tract of country is watered. As may be expected, the plains are flooded at this season, the only dry spots being the isolated mounds and hillocks. This superabundance of moisture does not appear to affect the health of the natives, who are a finer race of people than the Australians generally; and although more hardy than Europeans, they are quite as liable to attacks of cold and fever, owing to their more exposed mode of life.

WEST RIVER, which lies a few miles to the westward of the mouth of the Great South River, is a wide opening which has not yet been examined. It may probably turn out to be

merely one of the mouth of the South River, the western bank of which has not been traced above the point reached by Captain King. The coast westward from West River to Cape Hotham, a distance of 60 miles, and forming the south shore of the Gulf, has only been indistinctly seen. It is uniformly low and thinly wooded.

EAST RIVER, the mouth of which lies 12 miles to the eastward of that of the South River, is also a large opening, with a depth of two fathoms at low water, deepening to 4, 5, and 6 fathoms after the entrance is passed. Leichhardt's party had to penetrate about 30 miles inland for the purpose of finding a crossing place for the cattle, the country being of the same character as that of the South River, with numbers of natives, who were feasting on wild fowl and the nut-like root of a small rush called *Maruit* which abounds in the lagoon, and is the staple article of vegetable food among the natives of this region during the dry season. The East River is not likely to have a very long course, as the mountain range in which it must be supposed to take its rise, is not more than 40 miles inland.

The country from the East river to the neck of the Cobourg Peninsula continues of the same character. Open plains, occasionally flooded with the rains, and drained by salt water creeks into the eastern part of the Gulf, with abundance of good timber on the spurs from the hill-range. This region would appear

peculiarly attractive to a Malayan population. The coast abounds in fish, and the shelving banks are exceedingly favourable for the construction of those enormous fish-weirs of poles and bamboo-netting in which their industry is chiefly displayed, all the materials being at hand; while the sheltered nature of the coast would relieve them from the risk of having their labours destroyed in a single night, which so often happens in less favoured localities. At the same time the fresh water lagoons which come close up to the banks of the creeks on which their huts would be built, might be laid out in paddy-fields of the most productive description, so as to enable the fishermen to indulge in a recreation to which they are superstitiously addicted, for the operations connected with the growth of rice are rather considered as a pleasure than a toil.

Taking all circumstances into consideration, Van Diemen Gulf must be regarded as the gem of Tropical Australia, and it may even compete with the Victoria River as the site of the great northern capital. The coast at the head of the Gulf and the lower part of the great valley offer peculiar attractions to natives of the East, be they Malays, Chinese, or natives of India, while the upper parts of the valley, far into the interior, are admirably adapted for stock-runs. Seamen, too, will fully appreciate the open character of the navigation, and it is by no means improbable that the colonists of New South Wales and Victoria will prefer having the northern terminus of their mail and telegraph lines at a spot not more distant from their boundaries than the Victoria river, and much more favourably situated in other respects.

SECTION V.

NORTH COAST FROM MELVILLE ISLAND TO
CAPE WESSEL.

THE COBOURG PENINSULA—PORT ESSINGTON—PORT BREMER—RAFFLES BAY
—CROKER ISLAND—BOWEN STRAIT—LIVERPOOL RIVER—MEETING OF THE
TIDES—WESSEL ISLANDS.

The country bordering the north coast is clothed with forest, sufficiently open to allow a cart to pass through without much difficulty, and is well grassed, but at the same time so overspread with an undergrowth of saplings and tall plants as to intercept the view, and prevent the stockman from performing his duties;—while sheep farming is rendered impracticable by the destruction to which the fleeces are liable by the brushwood and grass-seeds. Indeed no known part of the Arnhem Peninsula is well suited for pastoral purposes except the upper part of the great valley of the Van Diemen already described, and some portions of the interior table-land crossed by Leichhardt during his overland journey. It will therefore be unnecessary to enter into very minute details respecting this coast, although it is by no means uninteresting to the merchant and navigator, as having, perhaps for centuries past, attracted annual fleets of fishing prahus from Celebes and Sumbawa in search of tortoise-shell and the trepang or sea-slug, which abound in this locality.

THE COBOURG PENINSULA is 120 miles in circumference, that is, a boat sailing round it from point to point would have to traverse this distance, but it is so indented with ports and inlets that less than half of the space enclosed is occupied by dry land. The Peninsula is crossed by a number of parallel ranges of sandstone from 80 to 300 feet high, running in a N.N.W. and S. S. E. direction, between which lie the ports and inlets above mentioned. Fresh water is abundant, either in permanent pools, or is accessible by digging to the depth of a few feet at the base of all these ranges, and the same rule applies to the north coast generally. On the outer coast, rocky points, and sandy beaches backed by open forest country, are the general features. On the shores of the inlets nearest the sea, the sandy beaches alternate with patches of sandstone cliff, but at the heads and on the upper shores of the inlets the belt of mangrove is universal.

The Cobourg Peninsula is the first land made by the trepang fishers from Celebes and Sumbawa who come with the westerly monsoon towards the close of the year; but they almost invariably pass on to Blue Mud Bay in the Gulf of Carpentaria, usually the extreme limit of the voyage, where they can pursue their labours with little interruption from the mon-

soon until the month of March, when they commence the return voyage with the first spurt of the Southeast Trade Wind. They fish along the north coast until their cargoes are completed, when they assemble in small fleets at some port on the north side of the Cobourg Peninsula, and refit for the voyage home, starting in May or June.

PORT ESSINGTON (Lat. 11° 10' Long. 130. 5.) is an inlet more than 20 miles in depth and comparatively narrow, containing both an outer and an inner harbour, the mouth of the latter being 15 miles from the open sea. It was on the western shore of this inner harbour that the settlement was formed by H.M.S. *Alligator* and *Britomart* in November 1838 and which was broken up in December 1849 by H. M. S. *Meander* removing the garrison to Sydney and destroying the buildings. The inner harbour was selected on account of its superior capabilities for the erection of defensive works, the establishment having been formed as a naval station. It proved to be less healthy than the outer harbour, the temperature being a degree or two higher, while the sea breeze sometimes failed to penetrate as far as the settlement; but no better site could have been selected without evading the instructions under which Sir Gordon Bremer acted.

And it was not known at that time that land-locked harbours in tropical climates are always unhealthy unless they are acted on by a breeze constantly blowing, so as to dissipate at once the malaria which arises from stagnant sea-water exposed to the rays of a tropical sun. As a harbour for affording shelter to shipping, it can scarcely be excelled, and it will no doubt be used occasionally for such purposes when the coast comes to be frequented.

PORT BREMER is another narrow but deep inlet lying a few miles to the eastward of Port Essington. It affords excellent anchorage, but is not frequented either by the trepang fishers or by the natives, the malaria being so great that a few days residence on its shores is nearly certain to be attended with an attack of fever.

RAFFLES BAY, the site of the first settlement formed on the Cobourg Peninsula, is more open and of less depth than Ports Essington and Bremer, but resembles them in its general features. An establishment composed of troops and convicts from Sydney was formed on the eastern side of the Bay in June, 1827, but it was broken up in March, 1829, subsequent to the occupation of Swan River on the west coast, the stores and a portion of the live-stock being removed to that place, the remainder of the latter

being left to breed and stock the country. The buffaloes, which were originally brought from Timor, have increased to some hundreds, or perhaps thousands, and have spread along the coast to the eastward, but no traces have been seen of the European cattle and ponies which were also left, although it is by no means improbable that they will have sought out some favourable spot among the neighbouring hills and have also increased in number. The garrison enjoyed good health, and, after a time, established friendly intercourse with the natives, of which we experienced the benefit when the establishment was formed at Port Essington, where friendly relations were never once interrupted.

CROKER ISLAND—is 21 miles long with an average width of four miles. Although so small in extent it contains specimens of every description of country found on the neighbouring main land. The points are composed of sandstone ridges, well timbered, and part of the interior is occupied by open plains, occasionally flooded, with lagoons well furnished with *maruait*, and swarming with waterfowl. The pasturage is also good, and it is said that some buffaloes have found their way across the strait and keep the natives on the *qui vive*, as these beasts generally charge

when they see them, probably remembering the time when the natives used to molest them with their spears, before they became aware of the impracticability of piercing buffalo hides with missiles pointed with wood or stone. The natives are numerous, and by no means so well disposed as the natives of the mainland, but they appreciate the fact that they have no back country to retire to in the event of their committing an offence deserving of punishment, and they are therefore easily kept in controul.

BOWEN STRAIT is the channel that separates Croker Island from the main land. It is about 3 miles wide, with an uniform depth of 5 to 7 fathoms. Captain Barker of the 39th Regiment, the last commandant at Raffles Bay (a highly accomplished officer who was afterwards killed by the natives at Encounter Bay while surveying the mouth of the great Murray River) recommended that the settlement should be removed to the shore of Bowen Strait, and it is certainly the most desirable spot as a residence for Europeans of any that has been found on the Cobourg Peninsula. Croker Island, although affording shelter for shipping, is too low to interfere with the sea-breeze, while the tides which sweep through the strait effectually

prevent the generation of malaria by promoting circulation of the waters, whose stagnation is alone to be dreaded.

LIVERPOOL RIVER, Lat. 12°S. Long. 134° 20' E. was discovered, and explored for 40 miles from the mouth by Captain King in 1819. The river is easy of access, having no bar, the depth at the mouth, which is 4 miles wide, being 10 to 14 fathoms, decreasing to 6 and 4 fathoms ten miles up, where the width is half a mile. The banks are lined with mangroves of a large growth up to the point where the water is fresh at half-tide, (14 miles from the mouth.) Above this, the banks spread out into broad plains which are occasionally inundated, and are precisely of the same character as those of the South River of Van Diemen Gulf.

The Liverpool River may hereafter prove to be a point of great importance, for although other rivers of equal magnitude may be discovered on the north coast, its central position must always secure the preference. There is every reason to believe that its valley extends far inland, as Leichhardt, when crossing its meridian, experienced a steady breeze from N. N. E. during the afternoon and early part of the night which he thought to be the sea-breeze blowing up the valley of the Liverpool, and

there is every reason to believe that he formed a correct opinion. As a port, too, it is magnificent, for a ship of much greater draught than the Great Eastern could enter with perfect safety.

WESSEL ISLANDS—at the northwest extreme of the Gulf of Carpentaria, are a chain upwards of 60 miles long, but so narrow that in some parts the distance across to the opposite coast is not more than half a mile. The islands are moderately elevated, with cliffs on the southeast side and a gentle slope to the beach on the northwest, the whole being well clothed with forest. A few natives have been seen by passing vessels, but little further is known about them, as there

is no record of any navigator having landed on the Islands, although they were seen both by Flinders and King, being, in fact, the point at which the former closed and the latter commenced his survey of the north coast. The Islands are of great interest in a geological point of view, as the ranges run in a direction at right angles to all others on the north and northwest coasts, namely N. E. and S. W.; the ranges on the adjacent parts of the main land corresponding in this particular. This would seem to indicate a disturbance by the volcanic action which has affected the islands of the Moluccan Seas, which are not very far distant.

Captain King has not stated the rise and fall of tide at Liverpool River, but he has incidentally mentioned that the tide fell 10 feet after the cutter anchored a little within the entrance, and in the Admiralty Chart high water is shown to take place at six o'clock at full and change of the moon, the same time as at Goulburn Islands, 50 miles to the westward. This point becomes of interest from the fact that there must be a meeting of tides in this neighbourhood, as at the Goulburn Islands the flood comes from the westward, while at Castlereah Bay, about the same distance to the eastward, it comes from *northeast* along the northwest side of Wessel Islands, and pours through Brown Strait into the Gulf of Carpentaria with a velocity of between 3 and 4 miles an hour. I suspect that the meeting will take place in Castlereah Bay, as the configuration of the land is favourable to that conclusion, while the velocity of the tide indicates great rise and fall in that neighbourhood.

SECTION VI.

CARPENTARIA.

WESTERN SHORES OF THE GULF OF CARPENTARIA—ROPER RIVER—LIMMEN
BRIGHT R.—WICKHAM R.—RED KANGAROO R.—SIR EDWARD PELLEW
ISLANDS—PORT PELLEW—SEVEN EMU R.—ROBINSON R.—MACARTHUR R.—
ABEL TASMAN R.—PASTURES OF THE GULF COUNTRY—VAN ALPHEN R.—
GREGORY'S TABLE LAND—THE NICHOLSON R.—SOUTHERN BRANCH—MOUTH
OF THE NICHOLSON—INVESTIGATOR ROAD—ALBERT RIVER—LEICHHARDT R.—
FLINDERS R.—THE DEAD LEVEL AT THE HEAD OF THE GULF—INDICATIONS
OF EXTENSIVE FLOODS—GILBERT R.—BOLD POINT—VAN DIEMEN RIVER—
STAATEN R.—NASSAN R.—LYND R.—THE MITCHELL R.—MOUTH OF THE
MITCHELL—WESTERN SHORES OF THE GULF.

The western shores of the Gulf of Carpentaria from Wessel Islands to Limmen Bight are not immediately interesting, being remote from the lines of communication along which the stock-runs are most likely to extend. There are several good harbours on the coast, and trepang of the best description abounds, but this is not calculated to tempt European enterprise. Nor is the country itself of very great promise as far as it has yet been examined by its only visitor, Flinders; the vegetation being stunted, while the supply of moisture owing to the coast being sheltered from the full strength of the northwest monsoon, is limited, indeed the rains are said sometimes to fail altogether for a season. On the other hand the Southwest coast of the Gulf, which runs in an almost straight line from the Roper to the Flin-

ders, a distance of nearly 400 miles, is probably more favoured by nature than any other piece of land of equal extent within the tropics. With the exception of the mangrove forests at the mouths of the numerous rivers, there appears to be scarcely an acre of land that does not afford pasturage, while the timber is good and abundant, and as for fresh water, the sea at the head of the Gulf is itself so fresh at times from the outpourings of the rivers, that the trepang fishers who are driven to the head of the Gulf by the strength of the monsoon, (occurrences which happen about every three or four years) fill up their fresh water alongside when anchored so far from the land that the tops of the trees are barely visible. The seasons are the same as at the Victoria River, with cold bracing winds during April, May, June, and July; but Carpentaria is free from the *hot* season of the Victoria, as a sea-breeze pours in from northeast every forenoon during the dry months, penetrating well inland, and cooling the atmosphere.

ROPER RIVER, which enters the sea near the bottom of Limmen Bight, is the best explored, of any of the Gulf rivers excepting the Flinders, which last was traced from its sources to the sea by the late enterprising explorer, Burke. Leichhardt came upon the Roper in the month of October about 20 miles from the sea, and found the country along its left bank well grassed and openly timbered chiefly with the Australian box. Waterfowl, especially ducks and geese, were exceedingly numerous, and the river abounded with fish, which the natives, who possessed iron cutting implements, caught in traps made of the wild rattan. Mussels were also abundant, and formed an important article of consumption among the natives. Leichhardt followed the river up in a westerly direction for

several days, the country rather improving as he ascended. A strong sea breeze blew up the valley of the river every afternoon, and proved very refreshing to the travellers. The natives, too were friendly, but the party suffered a great loss in four of their horses which were drowned while attempting to cross a deep tributary. Leichhardt left the river about Long. 134° 16', where "fine, well-grassed plains extended along the river, and between its numerous ana-branches: for the river divided into several Pandanus channels, either running or with chains of water holes" (*Journal* p. 455.) The party followed one of these creeks up to the N. N. W. in pursuance of their journey to Port Essington.

Mr. A. Gregory came upon the river during his overland

journey from the Victoria River, striking it in Long. $133^{\circ} 5'$, the sources of its southern branch in the table-land of lime-and sandstone which forms the dividing range, about 70 miles above the point where Leichhardt left it, and about 120 miles in a direct line from the bend of the Victoria River from which he had taken his departure. After following down a tributary for four days, he came upon the northwestern branch running S. E. and afterwards N. E. in a stream of 10 yards wide and 2 feet deep over a bar of limestone (July 1856) where the country opened out into a plain covered with high grass and reeds. On the following day Mr. Gregory left the river which turned to the northward and appeared to enter a range of hills running north and south, and continued his journey in a direct line towards the Gulf. The country at the head of the river is evidently poor although well grassed, and far inferior to the spot where Leichhardt's party struck off. The box-tree however, usually an indication of good land, is found on its upper waters also.

The mouth of the Roper has not yet been explored, and there is reason to fear that it will have a sand-bar, as the sea-breeze blows in from the northeast nearly every day during several months of the year, and this part of the coast is rather exposed.

LIMMEN BIGHT RIVER. Leichhardt came upon this river only a few miles from the sea, among a net-work of saltwater creeks, and followed it up for eight days (from October 6th to 14th) when he found a crossing place at a spot where a stony bar crossed the bed of the river. The river water was salt, but abundance of fresh water was found at the heads of the tributary creeks, where lagoons, such as those of Van Diemen Gulf, swarmed with wild fowl;—spoon-bills, Ibises, geese and whistling ducks being the most numerous. The bed of the river was broad and sandy, like that of the Lynd, and the flats which extended on either side were openly timbered and well grassed. Deep ponds of constant water were met with near its banks, and altogether the country is of a most promising character, and well adapted for running herds of stock. Natives are numerous near the mouth of the river, where they feast on shell-fish which seem to be particularly abundant. It is to be feared that a sand bar will be found at the mouth of this river, as well as at the mouth of the Roper, impeding the navigation at its entrance.

WICKHAM RIVER was struck by Leichhardt's party at the end of a ten mile's journey after crossing the Limmen Bight River and he considered it to be a tributary of the latter. "At

40 *Red Kangaroo River—Sir Edward Pellew Islands.*

the end of the stage, the uniform colour of the country was interrupted by the green line of a river-bed, so pleasing and so refreshing to the eye, with the rich verdure of its drooping tea-trees and myrtles, interspersed with the silver leaves of the *Acacia neurocarpa* and *Grevillia chrysodendron*. The river was formed by two broad sandy beds, separated by a high bergue, and was full 700 yards from bank to bank. It contained large detached water-pools, fringed with pandanus, which were very probably connected by a stream filtering through the sand." (*Journal*, p. 434.) The red wallabi was numerous, and one of a flock of red foresters was caught by the party and afforded an ample repast.

RED KANGAROO RIVER (*long* 136°) was so called from its being the spot where Leichhardt's party first met the famous red Forester of Port Essington (*osphranter antilopinus*). The whistling duck was also abundant, and the country was well timbered with cypress pine and stringy bark, but it does not seem to have been well grassed, as the cattle preferred the leaves of the rattan, which were growing in profusion. Indications of a hurricane, or rather a very strong gust of wind, having passed over the country from east to west, was seen in this neighbourhood. "October 3.

We travelled about six miles and a half north and by west, over a country equally scrubby as that of the preceding stage. The saplings had been killed by a bush fire, and a hurricane, which must have swept over the country some years ago, had broken and uprooted the larger trees, which lay all to the west and north-west. Since then, saplings had sprung up, and, with the remains of the old trees, formed a most impervious scrubby thicket, through which we could move but very slowly." (*Journal* p. 424).

SIR EDWARD PELLEW ISLANDS consist of a cluster of five islands, each from 7 to 17 miles long, with a number of smaller islets, lying close to the coast in longitude 137°, and occupying a space of 84 miles from east to west and 22 miles from north to south. They were discovered and partially surveyed by Captain Flinders in December 1802, who, however, did not explore the coast of the main land, which was only indistinctly seen. The islands are all hilly, the rock being a hard, close-grained sandstone with a small admixture of quartz, and slightly impregnated with iron here and there. The forest consists of several stunted varieties of the *Eucalyptus*, with *Livistona* palms and a kind of sandalwood which may some day become an article of commerce. The

mangrove abounds near the shores of the islands, and is used for fuel by the trepang fishers who occasionally resort to the islands. Fish and turtle are abundant, and small kangaroos, hawks, pigeons and bustards are found in the woods. Thirty five natives were seen from the ship on one of the islands, and traces of them and of their turtle feasts were found whenever parties landed, but they did not come forward to seek an interview, and like the natives of the Wellesley Group, near the bottom of the Gulf, seem to avoid intercourse with strangers.

The sheet of water on the inner side of Vanderlin Island, the easternmost and largest of the group, forms a capacious port, which will be of considerable importance as being the only one on the southwestern shore of the Gulf, if we except Investigator Road at the Wellesley Islands, which, however, is too far from the mainland to compete with Port Pellew as a convenient anchorage for vessels visiting the coast for commercial purposes. It is also probable that other ports will be found when the passages between the islands lying in the western part of the group come to be examined, and moreover the rivers which enter the sea on the parts of the coast sheltered by the islands are likely to be accessible to

shipping from having their channels undisturbed by the ocean swell. The three rivers discovered by Leichhardt in this neighbourhood and which are likely to enter the sea under shelter of the islands, are the Macarthur, the Robinson and the Seven Emu Rivers. It may be regarded as almost certain that at least one of these rivers will have a deep entrance.

SEVEN EMU RIVER.—This river, with the others mentioned above, become so interesting for the reasons already stated, that the smallest particulars respecting them are of value. I shall therefore extract copiously from Leichhardt's Journal, so as to give the particulars in his own words. "*September 14.* We travelled three or four miles northwest through a tea-tree forest, when the country opened, and a broad salt water river interrupted our course. It came from the W. S. W. and went to E. N. E. We proceeded eight or ten miles along its banks before we came to fresh water. In its immediate neighbourhood the country was beautifully grassed, and openly timbered with blood wood, stringy bark, the leguminous Ironbark, and the white-barked tree of the Abel Tasman. Over the short space of 8 miles we saw at least one hundred emus, in flocks of three, five, ten and even more, at a time: they had been attracted here

by the young herbage. We killed 7 of them, but they were not fat, and none seemed more than a year old. This extraordinary success induced me to call this river the "Seven Emu river."

"By following a track of the natives I found a fine well in the bed of the river, under the banks; the water was almost perfectly fresh; and that of the river was only slightly brackish. A fishing weir crossed the stream, where it was about twenty yards broad, and from two to three feet deep. We were occupied to a late hour of the night in cutting up our emus. I had intended to stop the next day, but as our camp in the bed of the river was surrounded by a thick underwood; as the dew was very heavy, the water brackish, and the young feed dangerous for our cattle, which had fed so long on dry grass, I thought it prudent to continue my journey. The longitude of this river, according to my daily distances, was $137^{\circ} 5'$."* (*Journal* p. 401.)

ROBINSON RIVER. Leichhardt came upon this river the day after leaving the Seven Emu, from which it is distant about 18 miles, but the entire party did not assemble there until two days afterwards "September 18. I went with

Charley to reconnoitre the country between Cycas Creek and the Robinson. A foot path led us from one to the other, passing through a series of Cycas groves, box and tea-tree forest, and thickets of Cypress pine. The latter covered large tracts near the Robinson, and frequently attained a large size. The river was about 200 yards broad, with steep banks intersected by deep gullies. Two tea-tree creeks, which entered it at the point where our examination stopped, contained fresh water in the upper part of their short courses. We crossed the river by a rocky bar, and below it was another, on which the natives had erected a rude wall of stone for catching fish. The upper bar was not covered even by the tide, but, above it, the water, although very bitter was not salt. We found here the carcass of a crocodile, and the skull of another was found near our camp at Cycas creek." (*Journal* p. 408). The Robinson is evidently a much smaller river than either the Seven Emu or the Macarthur, but as a large body of water pours down its channel during the rains, the mouth, if sheltered by islands, may possibly prove to be of sufficient depth to admit shipping.

MACARTHUR RIVER is the

* Cape Vanderlin, the north extreme of the eastern island of the Pellew Group, is in longitude $137^{\circ} 8\frac{1}{2}'$ East.

largest of the three streams whose mouths are likely to be sheltered by the islands, and it is to be hoped that it will prove navigable in the lower part of its course. It lies about 20 miles to the westward of the Robinson, the intervening country being clothed with forest, through which the travelling was hot and dusty, although a "refreshing breeze" from the sea was blowing up the valleys of the rivers. "Sept. 21. Our journey to-day was in a N. 50° W. direction for about 11 miles, through stringy-bark forest, in which the Melaleuca and Cypress pine were either scattered, or formed small patches of forest. We then crossed a shallow sandy creek surrounded with thickets of Cypress pine; passed some broad-leaved tea-tree forest, and came to a fine open country timbered with tea tree, and further on with box and white gum. After fifteen miles, our course was intercepted by the largest salt-water river we had yet seen, and we turned at once to the W. S. W. in order to head it. Deep hollows surrounded by tea-trees, but quite dry, extended parallel to the river. We observed several islands in the river, and it was joined by some deep creeks filled with salt water at their lower parts, but dry higher up. The whole country was equally open and well grassed. The leguminous iron bark,

the white barked tree of the Abel Tasman, the fig-tree, the Sterculia in fruit, grew in the forest, and the white water-gum in the hollows, the drooping tea-tree at the level of the freshes, and a species of salt-water Casuarina below it. I called this river the Macarthur, in acknowledgment of the liberal support my expedition received from Messrs. James and William Macarthur of Camden."

"When we were passing through the stringy-bark forest, about four or five miles from the camp of the 20th, we heard the calls of some natives behind us, and I stopped our train to ascertain what they wanted: they were soon perceived running after us, and, when they were sufficiently near, I dismounted and advanced slowly to have a parley, and was met by an old man with three or four young fellows behind him. As soon as he saw that I intended to make him a present, he prepared one in return; and when I gave him some rings and buckles, he presented me with some of the ornaments he wore on his person. As our confidence in each other was thus established, some of my companions and several other natives came up, and we exchanged presents in a very amicable manner. They were all well made, good looking men; and one young man, whose bo-

dy was coloured red, was even handsome, although his expression was somewhat wild and excited. All of them seemed to have been circumcised. Charley told me afterwards, that, at my first approach, some of them held their boomerangs ready to throw, but I do not think it was more than a simple attitude of defence, in case I should have proved the aggressor. On my enquiring about water, they pointed in the direction which we were going, and seemed to say. "It is far, but it is large." "Baco! Baco! Umava!" they frequently repeated with emphasis. John also told me that an old man had made signs of a large water, but not fit to drink, and was very anxious for us to change our course, Mr. Roper had understood the same. But, as long as we were ignorant what was before us, the pantomime and words of the natives enabled us to form but very vague and hopeless guesses. It was easy to understand them when we knew the reality. These natives must have had some intercourse with white men, or Malays, for they knew the use of a knife, and valued it so highly, that one of them offered a gin for one. They appeared equally acquainted with the use of our firearms. No doubt they had seen the Malays, and probably some had accompanied them to the is-

lands; as it is a common custom of the Malays to take natives home with them, that they may become friendly to them when fishing for trepang at this part of the Gulf." (*Journal* p. 412.)

The party did not cross the river until the 26th, five days after making it, when they headed the salt water, and found a stream of fresh water fifteen yards wide, where they crossed and continued the journey. Mr. Gregory came upon the Macarthur about 20 miles above the spot where Leichhardt crossed, and found the channel nearly dry. Certainly the rains had failed during the previous monsoon, but from the following extract from his journal, it is evident that its sources cannot be very far in the interior, "A quarter of a mile below the camp a creek, 15 yards wide, joined the principal creek from the S., and from the general lay of the country, it was evident that we had reached the principal channel of the Macarthur River of Leichhardt; but though from the steepness of the banks the floods frequently rise 30 to 40 feet, the creek did not bear the character of one taking its rise any great distance inland of our track."

ABEL TASMAN RIVER, so named by the Dutch navigators who first explored the Gulf, is in Lat. 16° 27' 37" Long.

137° 23, or 18 miles east of the Seven Emu River. It is of precisely the same character as most of the other rivers of the Gulf, being fordable immediately above the point reached by the tide. Leichhardt's particulars are interesting. "High hills were at its left bank; and as we followed it up in a direction S. 60° W., the right became more broken and the vegetation richer. A very conspicuous foot-path led us through heaps of cockle shells to a fishing station of the natives, where they seemed to have a permanent camp; the huts being erected in a substantial manner with poles, and thatched with grass and the leaves of the pandanus; there were extensive fire places containing heaps of pebbles; and an abundance of fish-bones. The weir was, as usual, formed with dry sticks

across a shallow part of the river. A spring of fresh water was below the camp at the edge of high water. As the tide was high, and an abundant supply of fresh water was found in a creek which joined the river a few hundreds yards from the fishery, we encamped on the creek in lat. 16° 28' 57 long. 137° 53'. I consider this river to be the Abel Tasman of the Dutch navigators, and that it is probably joined by the Calvert. Its flats were well-grassed, and very openly timbered with bloodwood, stringy-bark, leguminous Iron-bark, then in blossom, and a large tree with white smooth bark, spreading branches, and pinnate leaves. The salt water Hibiscus (*Paritium*) and Acacia (*Inga monoliformis*) were also in blossom." (*Journal* p. 396.)

The Calvert is a fresh water river, or rather river-bed which had been crossed the previous day. It is immediately after describing the Calvert that Leichhardt makes the emphatic statement in his journal which has attracted so much notice in the Colonies, and which is here given. "The whole country round the Gulf was well-grassed, particularly before we crossed the Nicholson; and on the plains and approaches to the rivers and creeks. The large water-holes were frequently surrounded with a dense turf of *Pimbristylis* (a small sedge), which our horses liked to feed upon. Some stiff grasses made their appearance when we approached the sea-coast, as well on the plains as in the forest. The well known kangaroo-grass (*Anthisteria*) forms still one of the principal components of the pasture. The scrubby country had a good supply of tufty wind-grass, and although the feed was dry during this part of the year, our cattle and horses did exceedingly well, as I have already mentioned.

Both took an occasional bite of some *Acacias*, of *Grevillea chrysodendrum* and of several other shrubs. Cattle driven over the country we have passed, by short stages, and during the proper season, would even fatten on the road." (*Journal*. p. 394).

Captain Flinders, who was in this neighbourhood in December, 1802, ran his ship on a rock near the mouth of Abel Tasman, but came off immediately without injury, and anchored in 4 fathoms. He says: "Our distance here from the shore was three miles. It is very low and broken, with many dry rocks and banks lying near it; and in the space of seven or eight miles five small openings, and behind them some lagoons were perceived from the mast head. The Abel Tasman River of the old chart is marked in about this situation; and however little these shallow openings and salt lagoons resemble a river, there is no other place to which the name could have been applied." (*Voyage vol. II. p. 161.*) The anchorage was in Long. $137^{\circ} 37' 18''$ E.

VAN ALPHEN RIVER.—The mouth of this river was also seen by Flinders, and its position well determined, as the opening bore $S. 3^{\circ} W.$ when the noon observations were taken, making the latitude of the ship $16^{\circ} 11\frac{1}{2}' S.$ Long. $137^{\circ} 53' E.$ He thus describes it: "The opening may be half a mile in width, but a dry sand runs across from the west side, and left no prospect of its being accessible to the ship; the shoal water, indeed, extended further out than usual, being caused, probably, by a deposit of sand from the inlet. The range of low hills, before mentioned as running behind the coast, was still perceived; but in front, the country was low as before, and somewhat less covered with wood." (*Voyage, vol. II p. 161*) Probably neither this river nor the Abel Tasman can be en-

tered except by vessels under 100 tons burthen, as the coast hereabouts is very shallow, the depth of water in fathoms generally corresponding in numbers with the distance from the shore in miles;—five fathoms at five miles distance, four at four miles, and so forth, while the rise and fall is only from four to seven feet.

Leichhardt came upon the Van Alphen in Lat. $16^{\circ} 41'$ Long. $137^{\circ} 48'$, where its bed was three hundred yards broad from bank to bank, but with only a narrow channel of running water. It does not appear to differ in any remarkable particular from the Abel Tasman. Mr. Gregory crossed this part of the head of the Gulf about 35 miles inland of the track of Leichhardt, and came upon two rivers which may have been the Abel Tas-

man and the Van Alphen. The following extracts from his journal relate to this neighbourhood: "*August 11.* Continued a S.E. route at 7. 40, ascending hills of limestone and sandstone, with an upper bed of basalt, which on the higher land to the S. W. was again covered by sandstone. The basalt was much decomposed, and contained fragments of the lower rocks. At 1. 50 camped on a fine but small creek, with permanent pools of water in a rocky channel 5 to 30 yards wide. The country well grassed and openly wooded with box, sterculia, leguminous ironbark, and terminalia."

"*August 12.* At 6. 50 resumed a S. E. route, traversing a broken country of limestone, chert, sandstone, and basalt, deeply cut by dry water courses. The grass was abundant and good, though triodia appeared on some of the higher ridges. At 9 crossed a small river with fine permanent pools of water in a rocky bed 10 to 30 yards wide. The floods rise 20 feet, and extend over a breadth of 70 to 100 yards; it is the largest stream bed passed since leaving the Roper River, and probably extends 50 or 60 miles farther inland. At 1. 25 camped on a small creek trending to the N. N. E. in which were pools of water 20 yards long and 5 feet deep."

If this river is found to extend so far inland as is antici-

pated by Mr. Gregory, its sources will be little more than 100 miles from Newcastle Water, the lake discovered by Macdougall Stuart in one of his latest expeditions.

GREGORY'S TABLE LAND lies near the meridian of 138° E., the northern edge being about a hundred miles inland from the coast of the Gulf between the Pellew and Wellesley Groups. It was ascended at this point by Mr. Gregory's party, who found the soil sandy, with a vegetation of micabark gum, stringy bark, and blood wood, and patches of acacia scrub. They left it the next day by crossing a ridge of altered sandstone and basalt, 1300 feet high, the greatest elevation that had been attained since the party left the Victoria River. "From this point," says Mr. Gregory "the view was extensive. Towards the interior the table-land, not being of equal elevation, appeared like a vast plain without any single marked feature." Descending from the ridge into a valley to the southward, where granite was met with for the first time, the party struck upon a tributary of the Nicholson River of Leichhardt, which was soon afterwards joined by a branch coming from the south, and apparently skirting the table land on that side. This tributary was followed until it joined a branch of the river coming also from the south,

The Nicholson River.

near the point where it had been struck by Leichhardt.

THE NICHOLSON RIVER, or at least the great branch coming from the westward, is of the same character as the Lynd, with a deep and broad sandy bed capable of carrying off an immense volume of water, but almost dry during the summer season, or when the monsoon or tropical rains have been less abundant than usual. And also, like the Lynd, it is joined near the lower part of its course by a stream of running water coming from a direction at right angles to its course, and belonging to a distinct system. The Nicholson was struck and crossed by Leichhardt at a point about 50 miles from its mouth, below the junction, indeed the southern branch was not discovered until ten years afterwards by Mr. Gregory, while following down the south bank of the western branch from the table land. Leichhardt named the river after Dr. William Alleyne Nicholson, of Bristol, "whose generous friendship" "he says in his *Journal*" had not only enabled me to devote my time to the study of the natural sciences, but to come out to Australia" (*Journal* p. 370.) He describes it as a river with a broad sandy bed and steep banks, and a stream 5 or 6 yards in breadth and very shallow. Mr. Gregory came upon the western

branch in Long. 137° 50 immediately after descending the table land, and followed it down to about the point where Leichhardt crossed, the course being nearly due east. The bed of the river was a quarter of a mile wide and sometimes more, with a sandy bottom, but devoid of water except in occasional pools. The upper part passes through a miserable sandstone country which improves as the southern branch is approached, when open grassy plains are met with, and a soil of red loam. The following extract from Mr. Gregory's *Journal* relates to the junction of the two branches. "Aug. 30. At 6.50 steered E. S. E. through box flats and open grassy plains, the course of the river nearly parallel to our route. At 10.10 came to a large tributary coming from the S., its principal channel was 30 yards wide, with pools separated by dry banks, but two smaller channels had running water. Water pandanus, fan palm, and casuarina formed a belt of trees along the bank of the stream, which bore quite a different character from that of the river above its junction." This was the first running water met with since leaving the Roper, the northern branch of which poured over a limestone bar in a stream 10 yards wide and 2 feet deep, coming from the northwest. As no other

running water is mentioned during the passage round the head of the Gulf, excepting Beames Brooke, which is only a few miles distant from the Nicholson, the source of this southern branch becomes a point of deep interest. The running branch of the Roper comes from the ranges near the centre of the Arnhem Peninsula, and the Mitchell, the running tributary of the Lynd comes from the direction of the high mountain range near Trinity Bay on the N. E. coast, which is well supplied with rain throughout the year.

The Nicholson has not yet been traced down to the sea, about 20 miles of the lower part of its course being still unexplored, but there can be no reasonable doubt that an opening in the coast 20 miles S. S. W. from Investigator Road and 2 miles west of Point Tarrant, is the mouth of the river. Still, the courses of Australian rivers are sometimes so eccentric that it would have been better had this point been distinctly ascertained. The opening alluded to was examined by one of the officers of H. M. S. *Beagle* while the ship was absent exploring the mouths of the inlets in the S. E. part of the bight. It is thus noticed by Captain Stokes, R. N. in his narrative of the voyage. "Two miles to the westward (of Point Tarrant) Mr. Fitzmaurice disco-

vered an inlet, which he followed a league in a general south-west direction, when it had in no way lost the promising appearance it possessed from its breadth, which was further increased by the manner in which the bank was thrown out off it. Nine miles further westward were two other small openings. Mr. Fitzmaurice's exploration terminated seventeen miles S. 56° E. from Point Tarrant, where another inlet was found of still greater magnitude and importance." (*Vol. 11 p. 300.*) This last proved to be the mouth of the Albert River, and the examination of the river and neighbouring country occupied the remainder of the *Beagle's* stay on this part of the coast.

It will be useless to speculate as to what is likely to be the depth of water at the mouth of the Nicholson, this being a point which nothing but actual examination can decide. It is, however, of considerable interest, as being likely to determine the class of vessel that will be employed in the Gulf trade, for it is of so much importance that cattle and horses, more especially the latter, should be shipped from a wharf or landing stage, that great sacrifices will be made to attain that end.

INVESTIGATOR ROAD is a good and capacious anchorage at the S. E. end of Bentick

50 *Investigator Road—Albert River—Leichhardt River.*

Island, the southernmost of the Wellesley Group. It is protected to seaward by a long low island, called Sweers Island, and has an uniform depth of 4 to 6 fathoms, the rise being 12 feet at the springs. Fresh water is easily obtained by sinking wells on Bentinck Island near the shore, and firewood is also abundant, but beyond fish, turtle, and a few birds, it has no other attraction. The fact, however, of its being the only known port near the head of the Gulf gives it great importance, and it must be the chief resort of shipping frequenting the neighbouring coast. The mouth of the Nicholson bears S. S. W. from the anchorage, distant 16 miles; the Albert River mouth about S. S. E., distant 27 miles; and Flinders River mouth about E. S. E. distant 65 miles. It is easy of access, with regular soundings, and no outlying dangers as far as yet known.

ALBERT RIVER was discovered and examined for a distance of 35 miles inland by the officers of H. M. S. *Beagle*, who found the water fresh and running at the head of the boat navigation, with fine open plains of brown loamy soil, well grassed, and with few trees. These were called Plains of Promise by Captain Stokes, and a great portion of the country near the head of the Gulf has since been ascertained

to be of the same character. It does not appear to be a river having its sources far inland, but the extent of good country found upon its banks, together with its position at the extreme head of the Gulf, will at some future time make it an important place. Capt. Stokes found the bamboo growing on the banks of the Albert.

LEICHHARDT RIVER—was discovered by the traveller of that name during his overland journey, and supposed by him to have been the Albert River, which caused some confusion in laying down his discoveries in this neighbourhood. This has since been cleared up by Mr. Gregory, who is an efficient critical geographer as well as an able explorer;—and as this left the river without a name, he conferred upon it that of the lamented traveller who had discovered it. The river, where Gregory crossed, was 80 yards wide, coming from the south, with fresh water in pools separated by rocky bars. The soil was a fine brown loam but the grass inferior. This river is supposed to join the Disaster River of Stokes, which enters the sea 13 miles to the eastward of the mouth of the Albert.

FLINDERS RIVER—was discovered by the officers of H. S. *Beagle*, who entered by a channel of two feet at low water, which increased to 3 and 5 fathoms inside. Capt. Stokes pe-

netrated to 17° 51' S. about 30 miles. The banks of the river, which were level and open, were estimated to be 25 feet above the level of the sea at this point. Mr. Gregory crossed in Lat. 18°, where the water was fresh, and the stream 100 yards wide, but very shallow; pelicans, ducks, and other waterfowl being very numerous but extremely wild. The Flinders has since been traced downwards from the neighbourhood of Mount Forbes in Lat. 21° 20' S. and near the meridian of 140° E. by Mr. Burke, the leader of an overland expedition fitted out in Melbourne in 1860, and who unfortunately perished with his second in command, Mr. Wills, while on their return from the Gulf. Mount Forbes is distant

270 miles about W. N. W. from the point where the Victoria River of Sir Thomas Mitchell reaches its northern limit and curves to the S. W. Mr. Burke found good feed and abundance of waterfowl during his journey down the Flinders, which at first ran due north and then N. N. E. until it reached the shores of the Gulf. As Mr. Burke used camels after entering the tropic, and had only a single horse which died during the journey, his success is not considered to be conclusive as to the practicability of the route for the transport of stock; but, except during very dry seasons, there seems very little reason to doubt that both feed and water will be abundant throughout the route.

The discovery of a direct route from the northern bend of Mitchell's Victoria River, in Lat. 24° S. and Long. 140° E. to the head of the Gulf of Carpentaria, which would be nearly midway between the routes already explored by Leichhardt and Burke, is of such large importance in connection with tropical colonization, that I shall extract copiously from Mr. Gregory's journal between the Flinders and the Gilbert River, which last he followed up to its sources in the elevated country where the Lynd and the Burdekin also take their rise. Mr. Gregory's party crossed the Flinders on the 10th September 1856, having camped on its left bank the previous day.

"Sept. 10. 6. 40 again found us in the saddle, and crossing to the right bank of the river, (the Flinders) followed it to the S. S. E. till 7. 20, when it turned to the S. S. W. Changing the course to E. we passed through a fine grassy plain for 2 m. and entered an open box flat well grassed, the soil a brown loam; this continued till 12. 30, when we entered a belt of chuncoa scrub, and at 1 reached a small water-course and camped at a fine water hole 50 yards wide and 100 yards long, with open grassy banks; the water appeared deep and permanent.

52 *The Low Lands at the Head of the Gulf—The Caron River.*

(Camp LXVII.) This water hole would render a great extent of the fine grassy land around available for pasturage. In passing through the box forest we observed several sleeping places which had been constructed by the blacks during the wet season. They consisted of 4 stakes 2 feet high, supporting a frame of small sticks 5 feet long and $2\frac{1}{2}$ to 3 feet wide: from 3 to 20 were often grouped together."

"September 11.—At 6. 20. steered E. for 1 hour through level box and terminalia flats, with good grass and brown loam; came to a lagoon 80 yards wide and nearly 1 m. long; beyond this was a creek with small pools water; as it appeared to come from S. E. we steered in that direction, but soon receded from it, as it turned to the S. S. E. Altering the course to the southward, at noon came to the creek much reduced in size, melaleuca scrub and triodia growing close to its banks, only a few shallow pools remaining. At 12. 25 camped at a small pool. (Camp. LXVIII.) On the banks of the lagoon passed in the morning, large heaps of mussel shells showed the spots where, from the immense collection of them, the blacks had camped for centuries successively on the same spots, and a well beaten foot path along the bank showed it to be a favourite resort of the aborigines. Very few birds and no kangaroo have been seen since leaving the Albert River. The common flies are very troublesome from their immense numbers."

"Sept. 12. The course of the creek being from the S. and water very scarce in it, it does not appear that we have yet reached the streams rising in the high land at the head of the Burdekin and Lynd Rivers. It therefore seems desirable to steer an E. N. E. course till some stream bed of sufficient size to retain water at this season be found, and then to follow it up to the ranges, where only water can be expected to exist to enable us to steer to the S. E. At an earlier season of the year, when water is more abundant, it would be desirable to ascend the Flinders River, and cross from its upper branches to the head of the Clarke; but under present circumstances this course would be highly imprudent, and no experimental deviations from a direct course justifiable."

This last river probably enters the sea at an inlet 10 miles east of the mouth of the Flinders, called Caron River in the old charts, and which was examined for a short distance by the boats of the "Beagle." The following notice of the locality is from Captain Stokes' narrative of the voyage. "On leaving the former, (the Flinders) he (Mr. Fitzmaurice) found that the shore trended N. 47° E. with a large inlet at the end of ten miles. This was only examined a short distance in a south direction; but from the bank being thrown out six miles from its mouth with a channel nearly half way through, it evidently disembogues a large volume of water, and we may reasonably infer it to be a river. It is named in the chart Bynoe's Inlet. Seven miles further was another inlet, with a sandy beach extending for two miles to the southwest of it. Five miles fur-

ther, the bend of the coast changed to N. 4° E. continuin almost straight in that direction to Van Diemen's inlet, distant twenty-five miles; and, with the exception of the first five, is sandy throughout. Thirteen miles from Van Diemen's inlet is an opening of some magnitude, near the south entrance point of it were small openings, and two and seven miles north of it, two others. "*(Voyage of the Beagle,*" vol. II. p. 324). The Caron River is evidently of sufficient importance to ensure its exploration upwards at an early date, and the country between this river and the Gilbert is scarcely less interesting, for it is in this neighbourhood that the trepang fishers assert the waters of the Gulf to be fresh and drinkable, miles from the coast, when the monsoon rains have been plentiful. This would imply an outpour far beyond that of an ordinary river or even system of rivers, and it will be interesting to see whether Mr. Gregory's experience of the country between the Caron and the Gilbert is favourable to this assertion, and I shall therefore continue the extracts from his journal, taking the liberty of printing in italics the parts which bear more particularly on this point. Mr. Gregory struck the Gilbert about 45 miles from the sea at a point 60 miles distant in a N. N. E. direction from the bank of the Caron River where we left him encamped on Sept. 12. His journal continues as follows:—

"The grass being scanty, the horses had scattered much, and we did not leave the camp until 10. 20, when we steered E. N. E. About a mile from the camp, passed four blacks at a pool of water; they did not observe us till we had passed, though only 100 yards distant and the country very open. *Our route was through level country, with box, bloodwood, terminalia, Grevillea, and broad leaved Melaleuca, patches of triodia and a little grass. The soil a hard ironstone gravel and clay.* Passing several dry shallow lagoons, came to a small dry watercourse, which we followed to the E., and at 2. 10 camped at a pool of water scarcely 4 inches deep. (*Camp LXIX.*) Near the camp were some fine grassy flats, but they were limited in extent and the grass was very dry. The cool S. E. breeze has ceased, and the N. and N. E. wind is very light and warm."

"*Sept. 13.—At 8 A. M. steered E. N. E. through box flats with broad-leaved melaleuca and a little grass. The country gradually became more scrubby, with Grevillea, terminalia, bloodwood, and triodia; the soil very poor, and in some parts sand and gravel. At 2 altered course to W., and at 5. 30 came to a dry creek with a rocky channel trending W., which we followed down till 6. 15 and camped without water.*"

The Flooded Plains at the Head of the Gulf.

"Sept. 14. Sunday.—At 5. 50 proceeded down the creek on a nearly W. course, searching in the windings of the channel for water, but without success till 10, when we found a pool of good water 50 yards long and 2 feet deep at which we encamped. Some blacks had recently been at this place, and their fires were still burning. The country on the creek is very poor, with patches of open melaleuca scrub, box, bloodwood, leguminous ironbark, terminalia, white gum, and a few pandanus, triodia, and a little grass. *The soil sandy loam and ironstone gravel.* The native bees appear to be very numerous, and great numbers of trees have been cut by the blacks to procure the honey."

Sept. 15.—At 8. 15 resumed our journey N. 10 E. over a *level country* thinly wooded with box, bloodwood, melaleuca, terminalia, Grevillea, and cotton trees, also a small tree which we recognized as Leichhardt's "little breadtree," the fruit of which when ripe is mealy and subacid; some of the party who ate this fruit suffered from sickness afterwards. Several dry watercourses trending W. were crossed, and at 2. 5 we camped at a small waterhole in a sandy creek 15 yards wide. (Camp LXXI.) By enlarging the hole we obtained though with difficulty, a sufficient supply of water for the horses. On the flats near the creek the grass was good, but very dry."

"Sept. 16.—Although our horses required a day's rest, none of our camps for several days past have afforded a sufficient supply of water and grass for a second night. Continuing a N. 20° E. course from 6. 25 to 7. 30, we came to a dry creek which we followed E. 1½ hours, when it decreased to a small gully; again steering N. N. E. passing over a *level country*, very poor, and with patches of melaleuca scrub. At 2 came to a sandy creek which we followed to the W. till 6; 5, without finding any water, and camped in an open box flat. (Camp LXXII.) I then walked down the creek, and was fortunate in finding a pool of water half a mile from the camp, and as soon as the moon rose we drove the horses to the water and filled our water-bags. *Few parts of our journey have been through a country so destitute of animal life on the level plains we have traversed since leaving the Flinders River. No kangaroo, or even their traces, emu tracks very rarely seen, and very few birds of any kind even at the water holes. Many of the sleeping frames of the blacks have been observed and thousands of deep impressions of their feet in the now dry and sun-baked clay show that during the rainy season the extremely level nature of the country causes it to be extensively inundated.*"

The country continued to be of precisely the same character until the party arrived on the banks of the Gilbert on September 21st, eleven days having been spent in crossing this dead level. When it is taken into consideration that the preceding monsoon had almost failed, but had still been sufficient to inundate the country, it becomes evident that this tract can scarcely be passable for some months after a heavy monsoon has passed over it. The

permanent route from New South Wales and even from Queensland to the north and northwest coast must therefore be carried to the westward of this meridian, for there is every reason to believe that the level will be found to extend a considerable distance inland.

GILBERT RIVER was discovered by Leichhardt, who came upon it after travelling 13 miles in a S W. direction from the Van Diemen, the last eight miles being through an open forest timbered with the box-tree, apple-gum, and white gum, well grassed, and abundantly supplied with water. Its course was W. by N., and it had a broad sandy bed, with numerous pools of water, and steep banks. It probably enters the sea by the opening of some magnitude, with ponds of fresh water near the south entrance, which Capt. Stokes mentions as having been found thirteen miles south of the mouth of the Van Diemen. Mr. Gregory came upon the Gilbert about 50 miles from the sea, and found it to consist of many sandy channels, in which only a few pools of water remained, running through fine open grassy flats, and having its course marked by a dense line of *melaleuca leucadendron*, flooded gum, and *morinda*. He also observed considerable quantities of mica mixed with the soil on the banks, indicating that the river rose in a country of primary formation. The principal channel 200 yards

wide, and the smaller channels occupying a breadth of half a mile. Mr. Gregory followed up the Gilbert to its sources in the mountain range in Lat. $18^{\circ} 45'$ and Long. $143^{\circ} 35'$, when he crossed the ridge, 2,500 feet high, to the sources of the Lynd, only a few miles distant. The country does not seem to improve in ascending the Gilbert, although water and grass were abundant; granite, porphyry, and slate becoming prevalent, and appearing to have been subjected to great disturbance. As one of the tributaries of the Burdekin has its sources only 55 miles east of the sources of the Gilbert, and the intermediate country, though rough (consisting partly of beds of lava) is tolerably well grassed, the Gilbert is likely to have stations on its banks, as soon as the Burdekin country, which is now rapidly filling up, has become fully occupied.

BOLD POINT, so named from its allowing a closer approach from seaward than any other spot on the south eastern shore of the Gulf, there being 4 fathoms at a distance of $2\frac{1}{2}$ miles from the sandy beach, is in Lat. $17^{\circ} 8'$ Long. $141^{\circ} E$. Two clumps of trees near the beach render

it conspicuous. The holding ground is good, and as it will be available as an anchorage except occasionally during the season of the N. W. monsoon, it is likely to meet with attention.

VAN DIEMEN RIVER, so named in the old charts, lies N. 23° E. from Bold Point, distant two miles. It was examined by the officers of H. M. S. *Beagle*, who found a depth of 2 feet on the bar at low water, and penetrated in the boats to a distance of 27 miles, but so tortuous was its course that the distance in a direct line from the coast was only 8 miles. Here the navigation ceased, and the water became brackish. As the depth was found to be $1\frac{1}{2}$ to 3 fathoms in the lower reaches of the river, and the rise at the springs is from 9 to 12 feet, it will be accessible to vessels of sufficient size to be employed in the transport of horses and cattle. The banks of the river are very low, never rising more than 10 feet, and sometimes only 3 feet above high water level.

Leichhardt crossed the river some distance above the reach of the salt water, where it had a fine sandy bed 70 or 80 yards broad, with pools of water and steep banks, the country being open grassy forest land in which the apple gum prevailed, with many swampy grassy lagoons covered with *Nymphaeas*.

STAATEN RIVER, of the old

charts, about thirty miles to the north of the Van Diemen, was crossed by Leichhardt at a ford in Lat. 16° 30'. It is of precisely the same character, as the Van Diemen, with well grassed open forest extending along both banks, and large deep *Nymphaea* lagoons running parallel with it.

NASSAU RIVER of the old charts, in Lat. 15° 53', was seen by Flinders during his visit to the Gulf, and appeared from the mast head to be a lagoon, separated from the sea by a bank of sand. Leichhardt crossed this river soon after striking off from the Mitchell, which he had done on finding that its mouth lay to the northward of the Nassau. For 9 miles before coming upon the river, he passed over what he describes as "a most beautifully varied country of plains, of forest land, and chains of lagoons." The natives are numerous, and of a bad disposition, for it was here that Mr. Gilbert, Leichhardt's able assistant, was killed during a night attack. Mr. Gilbert had resided several months at Port Essington, collecting specimens of natural history for Mr. Gould the ornithologist, and was very much beloved. He was also a great favourite with the natives, his exceeding kindness of disposition, combined with firmness of character, being exactly suited to call forth their admiration. His loss

must have been severely felt by his companions. He was the only one of their number who had had previous experience of the tropical region.

LYND RIVER was struck by Leichhardt on May 23rd 1845 in Lat. $17^{\circ} 58' S.$, at a distance of about 60 miles below its sources, three days after leaving the head waters of the Burdekin. The range which divides the eastern from western waters is apparently under 3000 feet in elevation, and is formed by an intrusion of basalt between granite ranges, with lava streams of more modern date penetrating and overspreading the basalt. Cypress pine and stringy bark were conspicuous among the forest trees. The nights here were very cold, the prevailing breeze being from E. veering toward evening to N. E., and during the morning a cold S. E. wind blew. The river was followed down to the N. W. through rocky ranges, with a broad bed, showing flood marks six to eight feet only above the level of the bed, the country having a wintery appearance but with plenty of grass. In lat. $17^{\circ} 45'$ a river joined the Lynd from the S. W. and a little below, three smaller tributaries join from the N. E. It now increases in size, containing large pools with numbers of ducks and spoonbills about them, the general course of the river being N. W. As far as Lat.

$17^{\circ} 30'$ the rocks are chiefly granite and porphyry, but here sandstone appears (and is not lost, except for a few days occasionally, during the remainder of the journey). Tributary creeks, many of them running brooks, now become numerous, the chief timber being the stringy-bark, the iron-bark and the drooping tea-tree. The Lynd joins the Mitchell River in Lat. $16^{\circ} 30'$, the lower part having a broad bed with numerous pools abounding in water fowl, but with running water only near the spots where it is joined by tributary creeks, the infiltration through its sandy bed being evidently very great.

THE MITCHELL RIVER comes from the eastward, and probably has its sources in the mountain cluster on the N. E. coast near Trinity Bay, which attains a great height in the neighbourhood of Cape Tribulation, the scene of Captain Cook's disaster in the *Endeavour*. The bed of the river at the point where the Lynd joins it is broad, sandy, and quite bare of vegetation, showing frequent floods, although only a small stream meandered through it when found by Leichhardt. The country along its banks was "an immense uninterrupted flat with a very clayey soil," lagoons being of frequent occurrence, abounding with Nymphaea, which appeared to form the chief vegetable diet of the na-

tives. Stringy-bark, bloodwood, the apple gum, box, the flooded gum, and a great variety of other trees grew near the river, the waters of which were more prolific than usual in the case of Australian rivers, several varieties of the perch, the *Silurus*, the guard fish, and a broad-scaled fish found also in the Mackenzie, having been caught by the travellers. A fish resembling a pike, and of the same habits, was also obtained, and a dead saw fish (*Pristis*), between three and four feet in length, was found dead in a neighbouring swamp. The lagoons, too, some of which were several miles long and very deep were also well stocked with numerous large fish, which, says, Leichhardt, "betrayed their presence by an incessant splashing during the early part of the night." (p. 293) About Lat. 16° the bed of the river is a mile wide, with a running stream of 30 yards, palm trees becoming numerous, indeed Leichhardt describes quite an Australian paradise. Of the climate, too, he speaks well. "The mornings and evenings were very beautiful, and are surpassed by no climate I have ever lived in. It was delightful to watch the fading and changing tints of the western sky after sunset, and to contemplate, in the refreshing coolness of advancing night, the stars as they successively appeared, and entered

on their nightly course. The state of our health showed how congenial the climate was to the human constitution, for without the comforts which civilized man thinks essentially necessary to life, without flour, without salt, and miserably clothed, we were yet all in health; although at times suffering much from weakness and fatigue" (*Journal* p. 299).

Leichhardt left the Mitchell in Lat. $15^{\circ} 52'$, as it carried him too far from the head of the Gulf, round which the party had to pass;—indeed they had to travel S. W. and sometimes south after leaving the river. He was of opinion that the Mitchell entered the sea about Lat. $15^{\circ} 5' S.$ where a "Water Plaets" is marked in the old charts, and Flinders found an opening in this neighbourhood which looked like the mouth of a river, as shown by the following extract from his narrative. At sunrise next morning (Nov. 12, 1802) the ship was steering southward with a land wind at east; and at seven o'clock we passed an opening near which several natives were collected. The entrance seemed to be a full mile in width, but a spit from the south side runs so far across that there is probably no access to it, unless for rowing boats; its latitude is $15^{\circ} 12' S.$ corresponding with a bight in the Dutch chart to the south of the

second *Water Plaets*; and the variation, with the ship's head on the meridian, was $4^{\circ} 43' E$. Our course southward was continued at two or three miles from the shore, in 3 to 4 fathoms; but at eleven o'clock, the sea breeze having then set in, the depth diminished suddenly to 2 fathoms, and in tacking, the ship stirred up the mud." (*Voyage*, &c. vol. II. p. 130.) The spit and the mud bank extending far out to sea, are unmistakeable signs of this being the mouth of a large river, and if it should prove to be the Mitchell or Lynd, of which there can be little doubt, Leichhardt will have left the river rather more than 60 miles from the mouth. A crocodile and a native canoe had been seen in the river before the party struck off for the coast.

The coast northward from the mouth of the Lynd or Mitchell to Endeavour Strait, a distance of 150 miles, is uniformly low and wooded, with a sandy beach, and numerous openings lined with mangroves, some of which may prove to be the mouths of rivers having their sources in the eastern coast-range. At Pera Head, in Lat. $12^{\circ} 58\frac{1}{2}' S$. some reddish cliffs were seen, apparently of sandstone, and a depth of 9 fathoms was found at a distance of a mile and a half from the cliff, but this is the only spot where the general uniformity is broken. This coast may some day be the seat of a great fishery, as trepang and turtle abound, while mother o'pearl shells of a large size are found near Endeavour Strait, and the banks are likely to extend southward along the coast.

SECTION VII.

NORTHEAST COAST.

TEMPERATE CLIMATE—WATERS ENCLOSED WITHIN THE GREAT REEF—
PORT DENISON AND THE BURDEKIN DISTRICT—ENDEAVOUR RIVER—
INTERIOR EXPLORED BY MR. KENNEDY—THE WATER-SHED CLOSE TO
THE COAST—PROBABLE SOURCES OF THE MITCHELL RIVER.

The Northeast Coast from Cape York to the mouth of the Fitzroy or Mackenzie River, a distance of 900 miles, although situated within the tropic, is so influenced by the trade wind and the comparative height of the land, that its climate is temperate rather than tropical, greatly resembling that of the island of Madeira. There can be no doubt whatever that at least 600 miles of this coast, and perhaps the whole, is fitted to be the seat of European races, in which they can increase and multiply without deterioration; and as European settlements are rapidly extending northward along the coast, having already reached the latitude of 20° S., while the popular party in Queensland is known to be inimical to the introduction of "coolie" labour, well wishers of Australia will probably have the satisfaction of seeing the entire N. E. coast occupied by an European people. The marine productions of the vast sheet of water enclosed within the Great Barrier Reef which extends along the entire coast, must sooner or later attract hordes of Chinese fishermen, who are better suited for developing their value than any other people,

and many on acquiring property will settle down on the coast and intermarry with the Europeans, as they have already done to a considerable extent in the southern colonies; but this need not create any alarm among those who stand up for the maintenance of purity of race, as it is more than suspected that some of the best breeds of Europeans were derived from the same stock as the bulk of the people of China. And I should not be at all surprised if this coast were to become attractive to the natives of the South Sea Islands, who could revel in the abundant fisheries to their heart's content, without the risk of passing through a raging surf before they reached the fishing grounds.

The last settlement formed on the N. E. coast is at Port Denison, near the mouth of the Burdekin, where a party was established under a Commissioner of Crown Lands in April 1861. In April the following year the population was 120 souls of all ages, including a Police Magistrate, a Clerk of Petty Sessions who also performed the duties of Collector of Customs, Postmaster, Government Auctioneer, Treasurer, and Registrar of Births, Deaths, and Marriages, and a party of Native Police under a Lieutenant. The township included a public house and six retail stores; and a small sailing vessel brought the mails monthly from Rockhampton, the capital of the Mackenzie River District, which enjoys regular communication by steam with all the southern colonies. In the neighbouring district of the Burdekin there are 9 cattle stations and 4 sheep stations, the quantity of wool exported during the first year having been 110 bales. The number of applications for licenses to occupy stations already filed in the Commissioner's Office was sufficient to absorb the greater portion of the land in the district, and it was expected that the first wool ship for England loaded at Port Denison, which is an excellent harbour, easy of access, would be dispatched in 1865.

The next settlement will be formed in the neighbourhood of Cape Tribulation, probably at the Endeavour River, where there is a great extent of open country, and access to the interior is easy, as the high and rugged mountain range which lines the coast from Port Denison to Cape Tribulation, ends a few miles to the southward. It was here that Captain Cook's ship the *Endeavour* was repaired, after having been nearly wrecked on a detached reef within the Barrier off Cape Tribulation, and the spot was found as Captain Cook says "most excellently adapted to our purpose;" further observing "and it is remarkable, that in the whole course of our voyage we had seen no place which,

in our present circumstances, could have afforded us the same relief." (1st voyage, Book III. Chapter III.) There are only eight feet water on the bar at low water, the rise being about 9 feet at the springs, so that very large ships will have to lie outside;—but for the class of vessels employed on the coasts of Australia, the port is everything that could be desired. The river is fresh nine miles from the mouth. The country bordering on it is open and well grassed, and as far as has yet been ascertained, there are no high ranges inland to impede communication with the interior. The exploring party under Mr. Kennedy, which landed at Rockingham Bay in May, 1848, passed through this country on its way to the northward, but owing to the lamented death of Mr. Kennedy and the loss of his journals, it is impossible to lay down his route distinctly. The journal of Mr. Carron, the botanist to the expedition, has however been published, and affords much interesting information concerning the country that was traversed, but it gives no clue by which the exact position of the party could be fixed until they reached Jane's Table Land, near Princess Charlotte Bay, 60 miles north of the parallel of the Endeavour River. The party arrived at this point on the 4th of October, four months after starting from Rockingham Bay, and as the carts had been abandoned on the 17th of July, this must have occurred far to the south of the Endeavour River, perhaps when abreast of Trinity Bay. Mr. Carron considered that the party was in the vicinity of Cape Tribulation on Sept. 4th and 5th. "On the 9th, "Mr. Carron says," we had a fine view of the surrounding country from the top of a high hill, in the midst of a range over which we passed. To the west and round to the south, the country appeared to be fine undulating forest land, intersected by numerous creeks and small rivers falling considerably to the westward, as in fact all the water had been running for some days past." It is evident from this that the high land near Cape Tribulation is the dividing range from the inner side of which the waters flow westward to the Gulf of Carpentaria; and this seems to have been the conclusion of the explorers, for next day the journal contains the following entry:—*examined. It to take a good view of the* "Sept. 10th.—Finding that the river continued running to the westward, and not, as we had hoped, towards Princess Charlotte's Bay, we left it and turned in a northerly direction, travelling over very rocky ridges covered with *cochlospermums* and acacias, interspersed with occasional patches of open forest land, and strewed with isolated blocks of coarse

granite containing crystals of quartz and laminae of white mica." The following entry dated *Sept. 15th* is of great interest. "About ten o'clock we came upon the banks of a very fine river, with a broad bed, and steep banks on both sides. No doubt this was the river we had seen to the eastward from our camp on the 9th instant. Mr. Kennedy considered this stream to rise somewhere near Cape Tribulation, and after running northward for about thirty miles, to turn to the southwest, the way it was running when we came upon it." As the mouth of the Endeavour is only 40 miles north of the parallel of Cape Tribulation, this "bend" to the southwest cannot be far distant from its upper waters; for Mr. Kennedy was too experienced an explorer to have been far wrong in his positions, especially at a time when he had his instruments still at his disposal. The reader who may have arrived at the same conclusion will read with interest the following entries in Mr. Carron's Journal made in this neighbourhood.

"Sept. 17th to 21st.—Leaving the river we turned northwest, and had occasionally fair travelling over stiff soil, intersected by many creeks, most of them dry, but were everywhere able to find water at intervals of a few miles. We passed over some ironstone ridges and rocky hills covered with *Callitris*, *Cochlospermum*, and *Sterculias*. On the stiff soil the trees were iron-bark, box, applegum, and some large acacias with long lanceolate phyllodia, and large spikes of golden coloured flowers. The grass here in the valleys between the hills had been burned, and was growing up again about eight or ten inches high."

"Sept. 22nd.—We crossed a creek running eastward overhung by melaleucas and arborescent callistemons, with plenty of grass on both sides; the soil appeared to become more sandy than that over which we had hitherto passed."

"Sept. 23rd.—We proceeded on our course, travelling over sandy ridges covered with *Eugenia Exocarpus*, and a very pretty *Eucalyptus*, with rose-coloured flowers and obcordate leaves, and yellow soft bark; also a dwarfish tree with dark green leaves, and axillary racemes of round monospermons; fruit of a purple colour, with a thin rind of a bitter flavour; also a great many trees of moderate size, from 15 to 20 feet high, of rather pendulous habit, oval lanceolate exstipulate leaves, loaded with an oblong yellow fruit, having a rough stone inside; the part covering the stone has, when ripe, a mealy appearance and very good flavour. I considered from its appearance it was the fruit which Leichhardt called the "nonda,"

which we always afterwards called it; we all ate plentifully of it."

"The weather for the last few days had been very hot, the thermometer ranging in the shade from 95° to 100° at noon; still there was generally a breeze in the morning from the eastward, and in the evening from the west. We camped by the same creek as on the previous day, but in our present position, it was running S. W. with several lagoons in the valley, full of *Nymphæa* and *Villarsia*; our latitude here was $15^{\circ}33'$ S."

"Sept. 24th.—We crossed the creek and proceeded northward till we camped by a dry creek, from the bed of which we obtained water by digging. During the day's journey, we passed over some flats of rotten honeycomb ground, on which nothing was growing but a few stunted shrubs, and a blue herbaceous plant belonging to the order *Boraginæ*. We also passed over other sandy flats covered with broad-leaved *Melaleucas* and *Grevillias*, and a few *Banksias*. On these flats ant-hills occurred, and in their vicinity there was seldom much grass. The grasses generally growing there were annual kinds. It was Mr. Kennedy's opinion that the creek we crossed this morning joined the river we left on the 16th, and formed the Mitchell, although the country hereabouts did not resemble the banks of the Mitchell as described by Leichhardt; but the appearance of the country varies so much every few miles, particularly to the westward, that it is impossible to support an opposite opinion on this ground."

The natives in the neighbourhood of the Endeavour River are numerous and apparently well fed. They are not an amiable people. Their conduct towards Mr. Kennedy's party was identical with their behaviour to Captain King thirty years before and to Captain Cook eighty years before, attempting to bully the strangers, setting fire to the grass, and even throwing spears, but making off and keeping out of the way as soon as they found that their visitors were not to be trifled with.

PART II.

INDIGENA.

**SECTION I.—USEFUL TREES, PLANTS AND OTHER VEGETABLE
PRODUCTIONS.**

„ **II.—FAUNA.**

„ **III.—MARINE PRODUCTIONS.**

„ **IV.—MINERALS AND WATER SUPPLY.**

„ **V.—ABORIGINES.**

SECTION I.

USEFUL TREES, PLANTS AND OTHER
VEGETABLE PRODUCTIONS.

VARIETIES OF TIMBER TREES—GENERAL DURABILITY—ADAPTATION FOR RAIL-
ROAD SLEEPERS—THE STRINGY BARK—CYPRESS PINE—FLOODED GUM—
DROOPING TEA-TREE—THE CASUARINA—THE IRON BARK—UNTESTED
TIMBER TREES—THE WHITE CEDAR—LEICHHARDT'S SARCOCEPHALUS—
AVICENNIA TOMENTOSA—THE MANGROVE—THE BAMBOO—NATIVE WIL-
LOW—THE PANDANUS—SILK COTTON TREE—THE WILD PLANTAIN—
SANDALWOOD—THE CABBAGE PALM—ESCULENT ROOTS AND HERBS—THE
WILD YAM, THE LONGAN, THE WATER LILY, THE WATER BEAN, MARO-
WAIT, PURSLANE, THE SOW-THISTLE, THE CAPE FIG—EDIBLE FRUITS—
THE NONDA, THE WILD GOOSEBERRY—WILD GRAIN AND GRASSES,—THE
TUSOCK GRASS, PANICUM, WILD RICE, THE WILD OAT.

As in the southern colonies, so also within the tropics, nearly nine-tenths of the forest trees belong to the Natural Order of Myrtaceæ, and, as a general rule, they do not attain an equal size to those of the south; indeed in some places, as on the islands in the Gulf of Carpentaria, the timber is absolutely stunted. The *Encalyptus* is still the ruling genus, but the *Melaleuca* is more strongly represented than in the south. The *Callitris* also re-appears here, and one variety yielding a timber of the most valuable description, namely the Cypress Pine, extends throughout the length of the tropical region,

and sometimes obtains possession of considerable tracts, to the exclusion of the Eucalyptus. The only varieties found in the tropical region and not in the south are some of the larger kinds of Mangrove and the *Avicennia tomentosa*, a sort of teak, which grows among the mangroves, the seeds of which may have drifted down from New Guinea or the Indian Islands, where the same variety is found. It is however highly probable that when the northeastern part of the Arnhem Peninsula comes to be explored, several other varieties of timber trees common to New Guinea will be met with, as several indications of a connection between the Flora of these two regions have already been discovered. Melville Island, too, would repay a closer examination, the timber there being of a much larger size than on the opposite main land, and some new varieties might be found. The bad disposition of the natives there, will, however, retard exploration.

Nearly all the varieties of timber found within the tropic, excepting the Silk Cotton Tree and the Mangrove, are of a very durable character. The piles with which the jetty at Port Essington was built, the very first work completed, were perfectly sound and uninjured by the *teredo navalis* when the Settlement was abandoned eleven years afterwards. They were all young gum trees, chiefly Iron Bark and Stringy Bark, with the bark still on, and to this they probably owed their preservation, for timber of the same description that has been squared is not impervious either to the *Teredo Navalis* or the White Ant, although the latter scrupulously avoids touching the bark or any portion of the wood in which the sap circulates. It would be well if this fact were known to Engineers in India, who are advertizing for *squared* timber for rail-road sleepers, as the process of squaring will remove its chief protection from vermin. If laid down with the bark on, and the ends covered with plates of lead or zinc, they would probably continue sound for several years; in fact some kinds would be almost indestructible, from not being liable to injury from damp or moisture. The Cypress Pine is utterly obnoxious to the white ant, and it belongs to an order which furnishes the most durable timber known, but it is not so iron-like in its fibre as the ordinary Gum Tree, and is not so well calculated to endure the wear and tear to which rail-road sleepers are subjected. This, however, is not much a matter of regret, as the Cypress Pine timber is likely to prove equal, if not superior, to teak itself for all building purposes.

STRINGY BARK.

(Eucalyptus .)

This tree is more widely distributed than any other variety of the Australian Gum Tree, and it almost invariably appears in extensive groups wherever met with, solitary trees being rare exceptions. This may be considered fortunate, as it is, beyond all comparison, the most useful to the colonist. The bark can be removed from the stem in long strips, the fibre of which is so strong that it is often used without any preparation as halters for horses, for tying up rails, and other purposes for which coarse rope is usually employed. The timber itself is sound strong and heavy, and, is perhaps the best of all the gums for planks and scantling to be used in building, while at the same time it splits easily, and is extensively used in making posts and rails for fencing, as well as shingles for roofing houses. The wood is not altogether obnoxious to the white ant, for although the insect declines attacking the outer shell of the trunk in which the sap circulates, the hearts of old trees, which have become dry and decayed, are often devoured by them; and persons employed in timber cutting have to be very careful in selecting trees that have not yet arrived at full maturity.

THE CYPRESS PINE

(Callytris .)

Although the Stringy Bark may prove the most useful to the colonist during his earlier operations, there can be no doubt that the Cypress Pine will be most valued as soon as he is able to attend to the comforts of life. It is a tree of beautiful growth, the trunk being often 5 feet in diameter at the base and running upwards without a branch for 30 to 40 feet, the smooth and clean appearance of the bark, so different from that of the Stringy Bark, adding much to its beauty. The timber is close-grained but comparatively light, easily worked, with an aromatic, cedar-like smell, and is susceptible of a fine polish. It is as yet so little known, although the same variety exists in the country inland from Moreton Bay, that the uses to which it can be put have not yet been tested, but there is every reason to believe that, like the teak, it will prove to be well adapted for all purposes to which an easily worked and durable timber can be applied. It is fortunate, too, that it is so widely distributed, and at the same time so abundant, as

to rank next to the Stringy Bark, and the Leguminous Iron Bark as a component of the inland forests.

THE FLOODED GUM.

(*Eucalyptus* .)

Called also the Blue Gum from the colour of its resin, and the White Gum, from the colour of its bark. This is a beautiful tree, and attains a very large size, and from its solitary character, growing in fresh water swamps apart from other trees, and along the margins of rivulets, it can generally be well seen from one point of view or other. The bark is white, of a soft, loose, and flaky character near the butt, but perfectly smooth above, and of a creamy white colour, tinged with blue. The timber is very much valued for ship building, more especially for keel and stem pieces and bend planks; so much so that saw-pits are often erected to cut up a single tree in spots so far from the coast that the carriage of the timber must entail a great expense. Some colonists assert that it is equal to teak timber for durability under water, indeed enthusiasts go much further, and declare it superior. However this may be it is certainly a valuable description of timber, and is likely to be retained for home use, as the trees, although numerous, are so widely spread over a large extent of country, that they would not repay the expense of carriage to the sea coast for exportation.

THE DROOPING TEA TREE.

(*Melaleuca* .)

This is also comparatively a solitary tree, as it rarely over-spreads the country, but prefers growing in lines along the margins of rivers and the shores of land-locked harbours. It is the tree that produces the Cajeput or Kayu Puteh oil of the Moluccas and Celebes, the well known medicinal oil, considered as an infallible remedy in cases of rheumatism, which, however, is not exactly the case. The timber is sound, but heavy, and is of importance as being the only timber immediately available in the banks of the Victoria River for the repair of vessels. The tree does not usually attain a very large size, a trunk of 18 feet in length up to the lower branches, and three feet in diameter, being about the largest size procurable. It is a graceful tree, and is likely to be preserved, as it often grows

where other trees are scarce or altogether wanting, and the natives regard it with almost religious veneration, as affording them shade and shelter in localities much frequented by them. The oil is obtained by distilling the leaves, a very simple process, and the cutting of the twigs bearing the most succulent leaves does not materially injure the tree itself.

THE CASUARINA.

(*Casuarina Littoralis*).

This tree, which is common to the Indian Islands, and even to India itself, is also local in its habits, delighting to range along the sea-shore only a few feet above high water mark, and when it is met with further inland, indications are generally also apparent of the spot having been the margin of the sea at a former period. The tree has so much the appearance of the fir that strangers are often deceived, but the mistake is soon discovered if an attempt is made to cut into the stem, the wood being peculiarly hard, and causing great injury to edge tools if not very well tempered. The timber is not much esteemed, although it might be put to many useful purposes. The natives make their heavy war clubs of the wood of the casuarina, this, indeed being almost the only use they make of timber except as fuel, for which small sticks are sufficient. The She-oak, a variety of the casuarina, is much used by the southern colonists for splitting into shingles for roofing, and the *Casuarina Littoralis* would answer the purpose equally well. Its destruction is, however, to be deprecated, as it is a great adornment of the landscape, indeed the shores of sandy tracts in which it most delights would look absolutely miserable without them; and the natives venerate them for the same reason that enlists their sympathies in favour of the Drooping Tea Tree, namely the agreeable shade it affords them when resting during their fishing excursions.

THE IRON BARK.

(*Eucalyptus*)

There are at least three varieties of Iron-Bark in Tropical Australia, namely the *Eucalyptus Resinifera*, which is so prominent among the forest trees of the southern colonies, or at least a variety which very closely resembles it; the Leguminous Iron Bark, which is by far the most numerous of the forest trees on the Cobourg Peninsula; and the Silver-leaved Iron Bark (*Eucalyp-*

tus Pulverulentus): which is only met with in widely scattered localities. Dr. Leichhardt, a good botanist, was of opinion, that the Iron Bark of Port Essington was not the real *E. Resinifera* although very much resembling it. (*Journal*, p. 535). In fact much confusion exists respecting the specific character of different varieties of this genus, colonists of newly opened districts being in the habit of conferring names that have become familiar to them, on trees which bear only a faint resemblance to the originals. Thus the Black Butt of Port Essington only resembles the Black Butt of the southern colonies in the bark being black up to the point reached by the annual bush fires, and grey above that line, a peculiarity that can be accounted for without insisting on a specific affinity. This confusion has made me reluctant to give more than the name of the genus in the headings of paragraphs on the varieties of the Eucalyptus, and in the case of the Iron Bark it will be of little consequence, as all the varieties are equally indifferent as timber;—flaws or faults filled with gum being common throughout the trunks, so that a sound piece of timber of even ordinary size is very rarely met with. The Iron Bark, however, is not without its value. The timber, when sound, is toughness itself, and forked pieces, cut from the stems of trees at the part where the branches begin to spread, are so highly prized in the ports of the Indian Archipelago for making wooden anchors, that they have been an article of export from the north coast of Australia by means of the Macassar and Sumbawa prahus perhaps for centuries. The young Iron Bark trees are also better adapted for piles and railway sleepers than any other known description of timber, and they will sooner or later constitute an article of export which is likely to contribute materially to the prosperity of the country.

UNTESTED TIMBER TREES.

There are many fine trees in the forests that may be found to yield good timber, but until the fact is ascertained, I am not disposed to admit them into this list. Among these are the White Cedar, Leichhardt's *Sarcocephalus*, and the *Avicennia tomentosa* of Captain King. The White Cedar (*Melia Azedarachta*) common in the brush inland of Moreton Bay, was also found by Leichhardt in the valley of the Burdekin. If it is the same as the Neem Tree, or Pride of India, which is supposed to be the case, it may prove a valuable tree. Leichhardt's *Sarcocephalus* was met with on the Lynd. His description is as follows:—"Along the river we discovered a large tree, about forty or fifty feet in

height, with rather singularly disposed horizontal branches, and rich dark green foliage, its leaves were oblong acute, and frequently a foot long; its flowers formed dense heads, which grew into a fleshy body marked with the arcoles of every flower. It is either *Sarcocephalus* or *Zuccarina*, or nearly allied to them. The tree has never been seen on easterly waters, but it was the invariable companion of all the larger fresh-water rivers round the gulf." (*Journal* p. 271.) The *Avicennia tomentosa*, which may prove to be a kind of teak, was found by Captain King growing among the mangroves on the banks of the Liverpool River to the height of from fifty to sixty feet, with a straight tapering trunk, three feet in diameter at the base.

THE MANGROVE.

(*Rhizophora*.)

This tree abounds throughout the coast region, mostly on the shores of deep bays, and at the mouths of rivers, where every alluvial bank that is formed becomes overspread very soon after it has risen to the level of low water at neap tides. Many of the trees attain a sufficient size to be cut into planks, which will remain sound for ten years or more if not exposed to the weather. The bark contains a powerful astringent, and is only inferior to oak-bark for tanning purposes. It is also used in China and the Indian Archipelago for dyeing purposes, cloth that has previously been dyed blue with indigo assuming a deep black colour when steeped in a decoction of Mangrove bark, and the colour becomes remarkably firm. The bark is extensively imported into China, where the Mangrove has nearly disappeared, and it may some day become an important article of export from Australia. The wood itself, when stripped of its bark, is much prized as fire wood, especially on board ships, as it splits freely, burns well, and is not infested with ants and other noxious insects, which usually swarm in pieces of fire-wood cut upon the dry land. It is, however, not to be recommended for building purposes except under peculiar circumstances, as it is very liable to be attacked by insects after the astringent bark has been removed, and the sap has evaporated.

THE BAMBOO.

A variety of the bamboo which grows to the height of 60 to 80 feet, is found throughout the tropical region, mostly on the

The Native Willow—Pandanus.

banks of rivers. It generally grows in detached tufts, widely scattered, but at the Adelaide River, dense forests extend along its banks for many miles, commencing immediately above the point where the mangrove ceases. The shoot is of a heavier and less flexible character than that of the varieties most common in India, but its strength is very great, and it is adapted for almost every useful purpose to which the bamboo is applied elsewhere. As far as is yet known, it is most abundant on the shores of Van Diemen Gulf and the Gulf of Carpentaria, and on the N. E. Coast, from Rockingham Bay to Cape York. The only use to which I have seen it applied by the natives is in the construction of their sole musical instrument, a hollow bamboo, from which they produce a sound by blowing through it somewhat similar to that of the drone of a Scottish bag-pipe.

THE NATIVE WILLOW.

(Hibiscus Tiliaceus.)

This is the *Warou* of the Indian Islands, where the bark is much used in making rope, the fibre being very strong. The twigs are also very tough and flexible, and they would probably be much used for basket making if the natives were not so abundantly supplied with the Rattan. It is much used in Java for shading roads and coffee plants, in common with the *Dadap* (*Erythrina Indica*) which is also found throughout Tropical Australia;—stout poles 10 or 12 feet long, fresh cut from living trees, being planted at the road sides or between the rows of coffee plants, which soon take root, and throw out a crop of twigs from the upper end which spread and form an agreeable shade. The twigs of the *Warou*, which grow to the length of 12 to 14 feet in a single season, can be cut every year like those of the pollard willow, and this is the mode in which the fibre can be most readily collected. As this variety of the *Hibiscus* is most extensively diffused, and is of an exceedingly hardy character, I anticipate that it will come to be highly prized by colonists when they have time to look about them and turn the natural productions of the country to account.

PANDANUS, OR SCREW-PINE.

This Palmito is very abundant, being found throughout the region both on the coast and in the interior, forming thickets immediately within the mangroves and lining the banks of rivers and

water courses from their very sources. The common variety is the *P. Oderatissimus* which grows to a large size, and which I believe to be the cabbage-tree of New South Wales, from the leaves of which the famous "Cabbage-Tree Hats" are made. The leaf is exceedingly strong and flexible, and is used by the natives to make baskets, which are generally so closely woven as to hold liquids. No palm produces leaves equal to this for making mats and bags. A variety with comparatively narrow, serrated, prickly leaves, about 6 feet long, is considered best for fine work, such as the siri and ornamental boxes, in making which the Malayan females are such proficient.

THE SILK COTTON TREE.

There are two varieties of this tree common near the coasts and the banks of rivers; the Bombax, or true silk cotton tree, belonging to the Natural Order of Sterculiaceæ, and the *Cochlospermum Gossipium*, which belongs to the Cistaceæ, or Rock-Rose order. The former grows to a very large size, and is used by the natives of some parts of the coast for making canoes, the process being simply shaping and hollowing out the trunk, the wood of which is exceedingly soft and easily worked, and so light that it can be used instead of cork as floats for fishing nets. At the same time it is not very durable, as the trunk decays in the course of a few months if cut down and left exposed to the weather. This tree has come to be extensively used in Java as supports for telegraph wires, being planted along the line at regular distances, and the wires attached to the living tree as soon as the trunk has attained sufficient strength to support it. The cotton produced is invaluable for stuffing pillows, feathers not being adapted for a tropical climate. It is also used for stuffing mattresses, but the fibre of the cocoanut husk is generally preferred, being cooler and more elastic. The cotton cannot be used for textile fabrics, the fibre not being sufficiently strong to bear twisting into thread.

The *Cochlospermum* also grows to a large size and is chiefly remarkable for the almost total absence of leaves, and the beauty of its flowers. The cotton is applicable to the same purposes as that of the Bombax, and the trunk would probably be found equally well adapted for supporting telegraph wires.

THE WILD PLANTAIN.

(*Musa*.)

A Wild Plantain, equalling the cultivated variety (*M. para-*

disaica) in the size of its stem and leaves, but not producing an edible fruit, is found on the N. E. coast; and has every appearance of being the *Musa textilis*, from the fibres of which the famous Manila Hemp is made. Its presence, however is chiefly of importance as showing that the soil and climate of that coast are adapted to its production. The plant has to be cultivated, so as to ensure a constant supply within a limited space, before it can be manufactured with profit.

SANDAL WOOD.

(*Santalum*.)

A variety of this tree is found on the western shores of the Gulf of Carpentaria. It very closely resembles that grown on the island of Timor, but the few specimens that I have seen were of inferior quality as regarded size and strength of aroma. It is, however, deserving of attention, for if found in large quantities (and the high lands of the N. E. coast and of the Arnhem Peninsula are very promising localities) it may become a valuable article of commerce.

THE CABBAGE PALM.

Every Australian Palm produces a cabbage, which is the heart or centre of the bunch of leaves with which it is crowned, but the Palm here described is the *Seaforthia*, the largest of all the native palms, and at the same time the most widely distributed. In appearance it is not unlike the coconut palm, the leaves especially bearing a very close resemblance to those of the coconut. The cabbage is large, sweet, and easily procured by simply splitting each leaf at the end and tearing it open, commencing at the outermost leaf, and taking each in succession until the heart is reached, no instrument being required;—and if palms are selected which have risen only two or three feet above the surface of the ground, a dozen cabbages may be obtained in the course of half an hour. Of course the tree is destroyed, but in spots where it abounds, as in some parts of the Cobourg Peninsula, where the Cabbage Palm often constitutes the entire forest for miles at a stretch, a few hundreds would scarcely be missed. However, when the country is settled, the palms are likely to be put to a better use, as the pith of those which have attained maturity, when the height of the stem is from 20 to 30 feet, furnishes sago of a very good quality. I was much struck by a paragraph in

the journal of Captain Simpson of the brig *Freak* when in search of the papers of Mr. Kennedy and his unfortunate companions in the Rockingham Bay Expedition. On visiting the camp near Shelburne Bay where eight of the party were left while Mr. Kennedy and the remainder pushed on towards Cape York, and where six of the eight left behind perished from starvation, he says: "I was rather surprised to find some cabbage palm trees growing in the vicinity of the camp; the tops are very nutritious, and would be very desirable for men in a starving state, had they been aware of it." Captain Simpson had been resident for some months at Port Essington, where the cabbage was almost in daily use, but he does not seem to have been aware of the value of the pith, which is at least equal in quality, and in the amount of farina it contains, to that of the sago palm of the Moluccas. Dr. Leichhardt's companions discovered the farina in the pith of the Bottle Tree (a *Sterculia* allied to the *Adansonia*) which they frequently chewed. (*Journal* p. 24). This property is indeed found in several Australian plants of distinct character, but in none, as far as I am aware, is the starch so abundant as in the Cabbage Palm.

ESCULENT ROOTS AND HERBS.

The WILD YAM is found wherever the soil is good, and delights most in the brushes or patches of Oriental Vegetation. The root is less mealy than that of the cultivated yam, but it is well flavoured. Gathering the roots is a work requiring great labour and patience, such as only the native women can be expected to endure, as the creeper has sometimes to be followed up for many feet under ground before the tuber is arrived at. The LONGAN of the Port Essington natives, the tuber of a *convolvulus*, is also well flavoured. It is long and narrow, and is more easily procured than the yam. The root of the *Nymphæa* or WATER LILY is also an article of great consumption among the natives, but is not likely to suit European tastes;—and the tuber of the *Nelumbium* or WATER-BEAN it highly esteemed, but is not abundant. The nut-like root of a sedge or bull-rush called *Marowait* by the natives of the Cobourg Peninsula, is however the most important article of vegetable diet during certain seasons among those tribes that have access to fresh-water lagoons;—and from their improved condition during this time it cannot but be wholesome. It is mostly eaten raw, but the natives have a mode of preparing it by crushing it between stones and then broiling the paste over the embers of a fire. This root may be turned to account by Euro-

peans, as it is sweet and well flavoured in its raw state, and may be improved by cooking. It is abundant enough in the spots where it is found, plains and shallow lagoons of hundreds of acres in extent being thickly covered with the plant.

PURLANE (*Portulaca*) grows spontaneously throughout the tropical region, and will be acceptable at newly formed stations, as will also be the Sow-Thistle (*Sonchus*) which is generally found associated with it. The heart or cabbage of the Pandanus was much used by the garrison of Port Essington until they procured a supply of vegetables of their own growth. It is rather tough, and not very well-flavoured, but it will have to be used at new stations if better esculents are not attainable.

The CAPE FIG, or Hottentot Fig, (*Mesembryanthemum edule*) is a creeping plant from the stem of which bunches of triangular spikelike leaves, thick and pulpy, sprout upwards at intervals. It also produces a fruit, but that of the Australian plant is not much esteemed. The leaf, however, is an excellent vegetable, and when boiled up with fresh meat to make soup, imparts to it a very agreeable flavour. Care, however, must be taken in picking the leaves, each of which should be gathered separately, and those that do not break off crisply should be rejected, otherwise the outer cuticle will be found stringy and bitter. It is a salsolaceous plant, and is found near the coast in every part of Australia, being generally the first plant trodden upon by a person landing on an open beach. It also abounds on the plains of the interior in the neighbourhood of salt lakes, and will be found on every small sandy island on the coast, sometimes even before it has become elevated above the highest level of the sea at spring tides. Indeed it seems to like the salt water, and the best is found on the most exposed coasts close to high water mark. The existence of this plant alone in such abundance is sufficient to prevent the risk of scurvy breaking out among parties of people who have access to it.

EDIBLE FRUITS.

A great variety of edible fruits were met with by Leichhardt's party during the overland journey, the greater number being fruits of different varieties of the *Eugenia*, to which genus the Jambo of the Indian Islands belongs. Probably some of these may prove to be valuable acquisitions, but the Jambo itself, which has been cultivated for centuries, is not a very highly esteemed fruit. The NONDA, which was found by Leichhardt's party near the head of the Gulf of Carpentaria, may prove of

importance, although as far as is yet known it appears to be confined to the extreme eastern division of the Tropical region. Leichhardt describes it thus :—"A middle sized shady wide-spreading tree, resembling the elm in the form and colour of its leaves, attracted our attention, and excited much interest. Its younger branches were rather drooping, its fruit was an oblong yellow plum, an inch long and half an inch in diameter, with a rather rough kernel. When ripe, the pericarp is very mealy and agreeable to eat, and would be wholesome, if it were not so extraordinarily astringent. We called this tree the "Nonda" from its resemblance to a tree so called by the natives in the Moreton Bay district. I found the fruit in the dilli of the natives on the 21st June, and afterwards most abundantly in the stomach of the Emu. The tree was very common in the belt of forest along the creek" (*Journal p.* 315). The tree was also met with by Mr. Kennedy's party when passing the neighbourhood of the Endeavour River, and Mr. Carron describes it in his journal as a tree "of moderate size, from fifteen to twenty feet high, of rather pendulous habit, oval lanceolate exstipulate leaves, loaded with an oblong yellow fruit, having a rough stone inside; the part covering the stone has, when ripe, a mealy appearance and very good flavour. I considered from its appearance it was the fruit which Leichhardt called the "Nonda", which we always afterwards called it; we all ate plentifully of it." Mr. Carron makes no mention of the astringent property. Probably it disappears when the fruit becomes fully ripe, which may not have been the case when Leichhardt met with it, as his note is dated July 3rd, while that of Mr. Carron is dated September 23rd. The fruit was not altogether unknown, as it had been found in the crops of the Torres Strait pigeons shot by the crews of vessels passing through Torres Strait late in the season. I find the following entry in my journal of the proceedings of the Port Essington expedition under the date of October 16th 1838 :—"In the evening we anchored close to the Claremont Islands, and a large party landed for the purpose of shooting. * * * The sportsmen had their hands full, for about dusk thousands of beautiful white pigeons, with black tips to the wings and tail (a species common to the islands of the Indian Archipelago) came in one continued flock from the main land to seek shelter for the night in the large mangrove trees, a dense grove of which bordered a salt water lagoon in the centre of the island. * * * The pigeons had been partaking plentifully of a fruit that very much resembled that of the date palm, and many

of them were absolutely crammed to such an extent that they could not shut their bills. One of the seamen who was persuaded to taste a specimen of the fruit that had dropped from the mouth of a wounded or frightened bird stated it to have a very sweet and agreeable flavour. I have not met with this fruit elsewhere in Australia, so that I have no means of giving an opinion as to the tree that produces it, but suspect that it will prove to be a palm." (*Enterprise in Tropical Australia*, p. 23.) There is therefore evidence of this fruit being in season from June 21st to October 16th a period of nearly four months, which enhances its importance very materially. I observe in the map of Mr. Burke's overland journey to the Gulf of Carpentaria that "Date Palms" are noted as occurring on the banks of the Flinders about Lat. 20°. This may also prove to be the Nonda, in which case it will extend over a tract of country 450 miles in length, this being the distance between the points at which it will have been met with by Mr. Kennedy and by Mr. Burke.

At Port Essington, the only native fruit that was at all esteemed was the GOOSEBERRY (*Coniogeton arborescens*) which was an exceedingly well flavoured fruit, and made a good preserve. It was also found by Leichhardt to be abundant on the table land of the Arnhem Peninsula, where the shrub grew to a much larger size than on the Cobourg Peninsula, but the fruit was identical.*

It may seem strange that out of nearly a hundred varieties of wild fruit so few should be deserving of record in a handbook; but it must be remembered that the fruits of Europe are not very palatable when in a wild state, and that with the exception of the wild strawberry there are few that could be eaten with much relish.

* Some confusion exists with respect to the classification of this plant. Leichhardt, who found it on the Table Land of the Arnhem Peninsula growing as a tree, and afterwards on the Cobourg Peninsula where it appears only as a shrub, but with a similar fruit, calls it the *Coniogeton arborescens* after R. Brown and De Candolle (*Journal* pp. 479 and 497) but it always struck me that the shrub was identical with the Cape Gooseberry common in India, (*Physalis Peruviana*) which is said to have been introduced from Rio Janeiro, but which now grows there spontaneously. Leichhardt has the following passage in his Journal under the date Nov. 16, 1845:—My companions had, for several days past, gathered the unripe fruits of the *Coniogeton arborescens*, Br.; which, when boiled, imparted an agreeable acidity to the water, and when thus prepared tasted tolerably well. When ripe they became sweet and pulpy, like Gooseberries, although their rind was not very thick. This resemblance induced us to call the tree "The little Gooseberry Tree." At the table land, and along the upper South Alligator River,

WILD GRAIN AND GRASSES.

The grasses of the tropical region are so many in number that an entire volume would be barely sufficient to describe them all minutely; besides which they are nearly identical with the grasses common in the settled districts to the south, and with the properties of which colonists themselves must be far better acquainted than any unpracticed grazier can pretend to be. I shall therefore confine my remarks to one variety which, I think is not known in the south—but which takes possession of the rising ground on the north and part of the northwest coast, almost to the exclusion of other kinds. It grows in tufts or tussocks separated from each other by spaces of from a few inches to two or three feet of bare ground. The seed-stalks grow to a height of from 5 to 8 feet, twenty or thirty in a tuft, and the seeds bear some resemblance to the oat until they are handled, when they are found to be longer, exceedingly thin and sharply pointed. The seed-stalks are jointed, and when young, the soft parts contain much saccharine matter which the natives are very fond of, and are incessantly plucking and chewing while passing through it. In this state it was cut for hay by the colonists of Port Essington for the use of the working cattle, who seemed to enjoy it as much as the natives did when in a green state, and were kept in excellent condition. I am the more particular in describing this variety of grass as the hay made from it is better suited as fodder for horses and cattle on a sea voyage than any I have seen elsewhere, not excepting the best oat-hay of the Cape of Good Hope; which however, ranks next to it, although it does not possess the saccharine property. When the sap is dried out, the grass becomes hard and uneatable, but soon falls a prey to the bush fires which are made at this season by the natives for the purpose of clearing the country; and in ten or twelve days after the fire has passed over it, the tussock will have become covered with a crown of young grass, so rich and succulent that it would be dangerous to allow horses and cattle to feed

it was a tree from twenty five to thirty feet high, with a fresh green shady foliage; but at the Cobourg Peninsula it dwindled into a low shrub. The fruit was much esteemed there by the natives; for although the tree was of smaller size, the fruit was equally large and fine. (p. 479.) The Cape Gooseberry has lately come to be cultivated in India, and the fruit is much esteemed, not only as a desert, but for tarts, jams, and preserves, and the variety so abundant on the Cobourg Peninsula will amply repay any care that may be bestowed on its cultivation.

at will, did not burnt particles of the old crop that are mixed up with the young grass form a sort of corrective.

Of the Wild Grain, which are so intermingled with the grasses that they cannot be separated, the *PANICUM* or Bread Grass of Mitchell's Victoria River, (which is probably the *Nardo* that supported Mr. Burke and his companions for a time) and the WILD RICE of Wickham's Victoria River are the most important as being extensively used by natives for food; but there are many others deserving of attention, as being calculated, when improved by cultivation, to become useful to man. Among the many avocations of a colonist in tropical Australia, none will be more interesting than the development of its natural productions, for which the field certainly appears most ample.

A WILD OAT, very closely resembling the European variety and bearing a seed of the same size, but bearded like barley, was seen by the officers of the *Beagle* in the neighbourhood of the Fitzroy River, and by Lieut. Grey near Hanover Bay. The latter traveller found them growing in such abundance on the Upper Glenelg that a crop might easily have been collected. He observes "When hungry, I have repeatedly eaten the oats, which in some parts grow in such abundance that several acres of them might be mown at once. I have little doubt that this plant would, with cultivation, turn out to be a very great addition to our tropical grains." (*Journals of Two Expeditions in N. W. and Western Australia*, vol. I. p. 197.) This grain may prove exceedingly useful to colonists even in its present state as fodder for stock on a sea voyage. It has not, however, been noticed as yet at the Victoria River, unless the Wild Rice found by Mr. Gregory should prove to be the same plant. As the vegetation of the Victoria closely corresponds with that of the Upper Glenelg and the Fitzroy in other respects, it can scarcely be altogether wanting.

SECTION II.

FAUNA.

THE RED FORESTER KANGAROO—THE BRUSH KANGAROO—THE WALLABI
—THE SWAMP BUFFALO—THE OPPOSSUM, FLYING SQUIRREL, AND NATIVE
DOG—THE WILD DUCK, BROWN DUCK, BLACK DUCK, TREE DUCK AND
SHELDRAKE—THE WILD GOOSE—THE PYGMY GOOSE—TEAL—JUNGLE
FOWL—THE BUSTARD—WILD PIGEONS—TORRES STRAIT PIGEON, PAR-
TRIDGE PIGEON, CRESTED PIGEON, HARLEQUIN PIGEON, BRONZE WING,
LEICHHARDT'S ROCK PIGEON, GREGORY'S BRONZE WING, AND STOKES' ROCK
PIGEON—SMALL GAME—THE QUAIL, SNIFE, AND SWAMP PHEASANT—
ORNAMENTAL BIRDS, THE EMU, JABIROU, NATIVE COMPANION, COCKATOO,
LORY, AND THE BOWER BIRD.

THE RED FORESTER KANGAROO.

(Osphranter Antilopinus.)

This is the largest variety of the Kangaroo common in the tropical region, and also the only one partaking of gregarious habits, as many as fifty being sometimes found in a flock. And as they prefer the more open country they afford better sport than the solitary Brush Kangaroos, which are sometimes run into by the dogs before they have fairly risen out of their forms, and rarely take to the open country. The Red Forester runs well, but as a general rule, is no match for dogs of tolerable speed, and as he generally sticks to the open country, the chances in favour of the

dogs are very great. But, if, owing to the intervention of a patch of brush, he is lost to sight only for a few minutes, his escape is almost certain. The Foresters do not attain a very large size, as far as my experience goes, from 60 to 80 lbs. being the average weight of those that were caught at Port Essington. It must, however, be confessed that the dogs, for good reasons of their own, perhaps, very rarely selected the larger Kangaroos from the flock, and when they did do so, and were successful in the chase, they generally shewed marks of a severe struggle having occurred before they succeeded in securing the game. The flesh of the Red Forester is well flavoured, but is generally devoid of fat except towards the tail, which last makes excellent soup.

THE BRUSH KANGAROO.

So named from its being generally found in the Pandanus brush on the banks of rivers, or immediately within the belt of mangroves on the sea coast, is smaller than the Forester, varying in weight from 30 to 50 pounds. There are several varieties, distinguishable only by their colour, which varies, from light red to a dun colour, but all are of nearly the same size, and have the same habits. They lie very close, and are sometimes caught by the dogs before they have fairly risen from their lairs. They are generally rather fatter than the Red Foresters.

THE WALLABI.

This is a small kind of Kangaroo, also of several varieties, the Rock Wallabi weighing only from six to ten pounds. It is very numerous in favourable localities, but is not often caught by the dogs, although it falls an easy prey to a quick shot who has been accustomed to rabbit hunting. The flesh is much esteemed.

THE SWAMP BUFFALO.

This animal was first introduced from Timor about 35 years ago for the use of the establishment at Raffles Bay, and when it was broken up (in 1827) all the females and a few of the males were left behind to stock the country. They now amount to many thousands and have spread along the north coast nearly, if not quite, to the Gulf of Carpentaria, and to the south as far as the bottom of Van Diemen Gulf. They are generally found congregated in herds of 20 to 50 of all sizes, under the guidance of a single full grown male, often of enormous size. But stragglers are occasionally met with far beyond the limits assigned above. The young males being turned out of the herd by the patriarch as soon as they approach maturity, become wanderers for life un-

less they can re-establish themselves, or gain a footing in other herds, which can only be done by killing or driving off the leading bull. Of course many are doomed to a solitary life, and wander far from the haunts of their fellows. Lientenant (now Sir George) Grey found the tracks of a large buffalo near Hanover Bay on the N. W. coast, upwards of 600 miles distant from Raffles Bay, and although this occurred only ten years after the settlement was abandoned, there can be no reasonable doubt of the straggler having come from that neighbourhood.

As the spread of this animal has created some alarm among colonists, who, from its being classed under the genus *Bos*, are under the impression that it may mix with their herds and injure the breed, it will be necessary for me to go into some details in describing it, more especially as I am unable to refer to any accurate scientific description, although such may possibly exist. The animal attains a much larger size than the European ox, the body being often 15 feet in girth, and sometimes more. The body is shaped somewhat like a cask, there being a rise towards the centre of the back, and a corresponding curve in the belly. The neck is short and thick, with a slight curve downwards instead of being arched, and the head, which is large and heavy, projects from the neck in a nearly horizontal direction, like that of the hog. The body is supported by short, sturdy legs, terminating in massive but well formed cloven hoofs. The horns are spreading, and of enormous size, extending backwards from the head, so as to lie nearly parallel with the neck and back when the animal is walking or swimming. The eye is small and not unlike that of the elephant, but without its intelligence, ears large and drooping, and tail rather shorter than that of the European ox. The skin is of great thickness, and being very scantily provided with straggling hairs, it has a leathery appearance, also like that of the elephant. The Australian buffaloes are all of a rusty black colour, but among the Indian Islands and on the Malay Peninsula, where the animal is common and in general use for agricultural purpose, many are of a dirty pink colour, with the skin covered with small freckles. The hair, even of the black buffaloes, is whitey brown but so thinly scattered that the colour of the skin only shews.

The habits of this animal are as singular as its appearance. During the day, when not feeding on the coarse sedgy grass which it prefers, it delights in wallowing in fresh water swamps, in which it often buries itself so deeply that only the head and nose are visible above the surface. This habit partly arises,

The Swamp Buffalo.

no doubt, from the susceptibility of its skin, notwithstanding its great thickness, to the attacks of insects, but it is also partly attributable to its really amphibious character, for it appears to be as much in its element when in the water as on the land, swimming with great facility, the form and disposal of the head and neck seeming to have been expressly designed for their convenience in this element. On land their movements are ungainly in the extreme, their usual pace being a slow deliberate waddle, but when excited they can move over the ground at a rapid rate, being very liable to trip and roll over if the surface of the ground happens to be uneven. No other animal, however, can pass with so much ease through swamps or over flooded rice fields, the bulk of their bodies preventing them from sinking very deep, while their short sturdy limbs are peculiarly adapted for propulsion under such circumstance.

The buffalo when in a wild or unbroken state is very unruly and headstrong, but it is easily trained, and when once broken in, the largest beast allows himself to be led about by a child. The first ship-load of buffaloes brought to Port Essington from the neighbouring islands consisted of very unruly brutes, indeed I believe they had been disposed of by their owners chiefly for this reason; but a few days on ship board was sufficient to tame them and several were broken in by the Marines, and employed dragging water carts in little more than a week after their arrival. Certainly the greater number of the remainder took an early opportunity of escaping into the forest, and were never recovered, but that circumstance does not militate against their docility when brought into contract with man. The agricultural Malays of the Archipelago, would, indeed be unable to carry on their rice cultivation without them, for as the preparation of the land takes place after it has been flooded to the depth of a foot or more, no other quadruped could assist them materially. The Malays use a sort of plough, a crooked piece of timber with an iron point, which is so light that a boy can carry it over his shoulder with ease, but the soil is really prepared by the trampling of the buffalo, the plough being of little use except to mark the ground gone over. Indeed some of the more ancient tribes, those of Timor and Rotti for example, dispense with the plough altogether, and prepare their rice lands by driving herds of buffaloes repeatedly over it.

In Tropical Australia the buffalo will be found useful by timber cutters employed in the neighbourhood of swampy land, and as there is not the slightest chance of their mixing with the settlers herds, the antagonism between the two breeds being unsurmount-

able, their presence in Australia must be considered rather as an advantage than otherwise. The delight of Leichardt's party when they secured their first buffalo on the east side of Van Diemen Gulf is well expressed in his journal. "At the discharge of the gun (at some ibises) a buffalo started out of a thicket, but did not seem inclined to go far; Brown returned, loaded his gun with ball, went after the buffalo and wounded him in the shoulder. When Charlie came back to the camp, he, Brown, and Mr. Roper pursued the buffalo on horseback, and after a long run, and some charges, succeeded in killing it. It was a young bull, about three years old, and in most excellent condition. This was a great, a most fortunate event for us; for our meat bags were almost empty, and as we did not wish to kill Redmond (a bullock) our good companion, we had the prospect of some days of starvation before us. We could now share freely with our black friends, and they had not the slightest objection to eat the fresh meat, after baking in their usual manner. They called the buffalo "Anabaru" and stated that the country before us was full of them. * *. I was struck with the remarkable thickness of their skin, (almost an inch) and with the solidity of their bones, which contained little marrow; but that little was extremely savoury" (*Journal* p. 524). It is to this thickness of skin, which renders it impenetrable to wooden spears, that their rapid increase is chiefly attributable, as it has led the natives to abstain from attacks that could only lead to their own discomfiture. Although the skin is so thick, it can be made tender and palatable by skilful cookery, indeed it is preferred by the Malays and Chinese to the meat itself. The latter have a mode of preserving pieces of the skin by boiling it down into square cakes, which are afterwards dried, and will keep for years. It has then all the properties of gelatine, and is esteemed a great dainty.

The following account of the buffalo of Java, and of the estimation in which it is held by the natives, is extracted from M. Von Hogenderp's "*Coup D'Oeil sur L'Isle de Java*," a work of great merit. It would apply equally well to the Malay Peninsula, where the buffalo is of the same variety as that of Java and Port Essington, while the agricultural Malays very closely resemble the Javanese in every custom and characteristic. "If a Javanese is asked what animal is most useful to man, he replies without hesitation that it is the buffalo, which he calls in Malay *Karbau*, and *munding* in the idiom of the mountains. In speaking now of his country, it is just to give the first rank to the animal he prefers; in effect, the buffalo renders him the

greatest services; it is the buffalo that serves him to cultivate the fields, to transport the crop, and its flesh figures as the essential part at the feasts he gives on solemn occasions, as marriages, births, circumcisions, &c. Too often also it is the desire to possess so useful an animal that proves to the Javanese the greatest of temptations:—out of ten criminal cases brought before the tribunals, especially in the interior, one may be assured that eight of them will be relative to the steaking of buffaloes."

"The description of the buffalo, will be found in all works on natural history, and I will therefore not enter into details on that subject;—that of Java is of the large kind, hairless. (*à poil ras*), with large horns placed horizontally, of the shape of a fat ox; there are both white and blueish black animals, the latter are most esteemed as being more vigorous and affording better meat; that of white buffaloes being even considered more or less unwholesome."

"The buffalo requires water, he would pass his life embedded in a river; the careful Javanese washes him every day several times, and when he detaches him from the plough or cart, he takes great care to do so in the neighbourhood of a river or a marsh; the animal immediately makes for the water and lies down in it, often leaving only the end of his snout above the surface to enable him to breath."

"The Javanese does not give himself much trouble in augmenting the numbers of this useful beast: the females are not sufficiently numerous for a multiplication proportioned to the wants of agriculture, transport, the service of the sugar mills, &c., because the natives, with too little foresight, easily sacrifice the young females required for breeding when some fête is about to take place. For a long time since the government has endeavoured to remedy this evil by prohibitive laws, and they ought to be renewed every year in the regulations of the farm of native slaughter houses." (*p.* 209).

The Opossum, the Flying Squirrel and the Native Dog complete the list of noteworthy quadrupeds. There are two varieties of opossum, both common in the South, one the tree opossum, and the other kind with white spots which is sometimes destructive in poultry yards. Native Dogs are not numerous, and can easily be kept down by the Kangaroo dogs, which always attack them if permitted.

THE WILD DUCK.

I look upon the wild duck as the most important of the game birds of Tropical Australia, as it is likely to make its appearance on the tables of the colonists more frequently than any other description of game. The most common variety is the BROWN DUCK (*Leptotarsis Eytoni*), which is not unlike the common wild duck of Europe, except that it is rather smaller and has longer legs. It is gregarious in its habits, at least during certain seasons, and frequents the lagoons in immense flocks. Very little is as yet known respecting its general habits, the locality in which it breeds being still a mystery, but I think it will turn out that it rears its young among the quiet mangrove creeks which abound on the coast, where it would certainly be very little liable to be disturbed. This, however, was not the general impression among the residents at Port Essington, who from often hearing large flocks pass overhead from the northwest towards the southeast during the early part of the night, were led to think that they migrated from some distant country towards the north. But the fact that flocks would also be heard passing in the opposite direction towards daybreak tends to show that these flights might merely be between the feeding grounds and the roosting places. The direction of their flight can always be traced although the birds themselves are not seen, as the rapidity of the motion, with the fluttering of innumerable pinions, produce a clear, shrill whistling sound which can be heard a great distance. This has led to their being sometimes called the "whistling duck," but the name is equally applicable to the other varieties found in this region; as is also that of "tree" or "wood duck," which, however, is applied particularly to the *Bernicla Jubata*;—every known description of water fowl including geese, teal, and sheldrakes occasionally perching on the trees, although they perform the feat so clumsily as to show that it is somewhat against their nature. Perhaps the periodical occurrence of extensive floods has rendered the practice necessary. The *Leptotarsis Eytoni* is found throughout the Tropical Region.

The BLACK DUCK (*Anas Novæ Hollandiæ*) is also distributed throughout the region, but is never seen in immense flocks like the Brown Duck. It appears to be a permanent resident in the country, breeding in the neighbourhood of the creeks and fresh-water lagoons.

The TREE OR WOOD DUCK (*Bernicla Jubata*) also breeds in the country, and frequents the inland lagoons and water

courses, where it is often found in large flocks. It appears to be more numerous on the rivers that flow towards the N. E. coast than elsewhere, but it is not unfrequent in the more western parts of the region.

The **SHELDRAKE** (*Tadorna Rajah*) was first met with by Captain Flinders at the Sir Edward Pellew group, in the Gulf of Carpentaria, and it has since been found throughout the region, more especially on the Cobourg Peninsula, on the banks of the Victoria, and in the neighbourhood of the Lynd River, where Leichhardt saw them in swarms, perching on trees, rising, when disturbed, with a loud noise, and circling around in the air. It is a very pretty bird of a white colour, with black bars on the wings, and the legs and bill of a pale pink colour.

THE WILD GOOSE.

(*Anseranas Melanoleuca.*)

This bird is found in large flocks on the lagoons of the north coast and the Gulf of Carpentaria during the latter half of the year, but whether it remains permanently there, is not yet known. It certainly breeds there, for its eggs are consumed in large quantities by the natives, and appear to be even more esteemed than the birds themselves. They are not all alike in colour some being black and white and others grey, but I believe that there is only one variety yet known. They are by no means so handsome a bird as the European Goose, and their appearance is peculiarly ungainly as they sit perched on the trees, scarcely able to maintain their balance, and gazing about with a vacant curiosity;—for these are the circumstances under which they were first seen at Port Essington, a flock of about twenty having arrested their flight while passing over the settlement and settled on the neighbouring trees, apparently to see what was going on. Nor is their flesh so well flavoured as several other varieties of wild fowl. Perhaps it would improve if they were reared as poultry, in which I do not anticipate much difficulty, for they seem to be easily tameable, and eggs could be obtained in any quantity that might be required during the proper season.

THE PIGMY GOOSE.

(*Nettapus pulchellus.*)

This beautiful bird, which is about the size of an ordinary teal, has only been met with as yet on the Cobourg Peninsula and on the banks of the Victoria River. It is a perfect goose in miniature, but with a plumage far exceeding in beauty that of

any other of its tribe, the back being a bright glossy green, and the wings prettily marked with streaks of white. If domesticated, it would be very much esteemed as an ornament to the poultry yard.

THE TEAL.

(*Querquedula castanea*.)

As far as appearances go, this bird does not differ in any remarkable particular from the teal of Europe. It is found throughout the region, either in pairs or in small flocks of from twelve to twenty.

THE JUNGLE FOWL.

(*Megapodius tumulus*.)

I do not know how the name of Jungle-Fowl came to be conferred on this singular bird, for it is altogether unlike the Jungle-Fowl of India, but I believe the Port Essington colonists were guilty of the misnomer. It is a brownish black bird, very much resembling the Guinea Fowl in size and shape, but with very large and strong gallinaceous feet, which are essentially necessary for its habit of forming nests of what is known in England as "garden rubbish," which they scratch together until mounds are formed by a single pair of birds which sometimes reach the dimensions of 5 feet in height and 40 feet in circumference at the base. In these they deposit their eggs, which are of a very large size, and leave them after covering them with rubbish to be hatched by the natural heat engendered by the vegetable decomposition. It is said that the parent birds keep an eye upon the nests while the eggs are undergoing the process of hatching, which may or may not be the case; but certainly the young, when they emerge from the egg, are able to scratch their way into the world without assistance, and they display a cunning and capacity for concealment far superior to that of their parents, who generally fall an easy prey to the first sportsman that happens to encroach on their retirement;—indeed I very much fear that this interesting bird will soon become extinct, as its stupidity is so great that it will sometimes remain sitting on a branch without moving after several ineffectual shots have been fired at it, when it is sure to be brought down at last.

The tumuli of the *Megapodius* are found only in the patches of brush which are common throughout the north and east coasts near the sea, where the vegetation is altogether of a

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tropical character, such as exists in the Indian and Pacific islands, some varieties of the *Ficus* being always present. Perhaps the bird received its name from its being found only in these patches (for it seldom leaves them willingly) as the oriental character of the vegetation may have suggested the term "jungle."

THE BUSTARD.—The two varieties of this bird which are common in the Southern Colonies also extend throughout the tropical region, but they are scarce, except in the neighbourhood of the N. E. coast range. A new bird speckled brown and white, about the size of the Guinea Fowl, and apparently of the same habits, was wounded by Dr. Bynoe at the Adelaide River, near Van Diemen Gulf, but no specimen was secured. It will probably prove to be a variety of the megapodius, which seems to represent the Bustard and Brush Turkey in the tropical region.

WILD PIGEONS.

The tropical region is emphatically the country of the wild pigeon, for it exists in such numbers as sometimes to astonish even old residents, and the varieties are also numerous, nearly every explorer of a new tract adding to the list. The TORRES STRAIT PIGEON (*carphophaga luctuosa*) is perhaps the variety most extensively distributed. It is a fine strong bird, about the size of the English wood pigeon, of a white or pale cream-colour, with black tips to the wings and tail. It is very strong on the wing, and appears to think nothing of a flight of a hundred miles from the resting place (generally a mangrove forest, with the roots of the trees in the water) to the feeding ground. As may be expected under these circumstances, the bird is not peculiar to Australia, but extends throughout the Indian Islands as far as the northern entrance of the Straits of Malacca. It generally feeds in pairs, and when seen in large flocks, which only happens towards dark near their favourite resting places, I think it arises from many thousands of pairs having assembled at one point, often from a widely-spread surface of country.

THE PARTRIDGE PIGEON, (*Geophaps scripta*) is formed exactly like the partridge, and runs and rises like that bird, but it generally settles on the first bare branch that comes in its way, and then the illusion ceases. It is rather larger than the common pigeon, and is esteemed a great delicacy. It is generally met with in pairs, but flocks of fifty and upwards are occasionally seen near the water holes, and not elsewhere, as far as my experience goes.

THE CRESTED PIGEON (*Geophaps plumifera*) is a beautiful

little bird, even more gallinaceous in its habits than the Partridge Pigeon, which it much resembles, being of a compact form and light red colour, but it is smaller, and is provided with a high crest. It is generally found in coveys, and would be called a quail but for some slight peculiarities of beak and feet, which are held to class it with the pigeon.

The HARLEQUIN PIGEON (*Peristera histrionica*) extends throughout the region, and assembles in large flocks on the banks of rivers and near the sea coast.

The BRONZE-WING PIGEON of New South Wales is found throughout the tropical region, but it is scarce. Its place seems to be supplied by the Partridge Pigeon.

LEICHHARDT'S ROCK PIGEON (*Petrophassa*) was met with by this traveller in considerable numbers when crossing the Arnhem Peninsula. It has a dark brown body, and light brown wings, and roasts among the precipitous rocks of the Table-land. It is interesting, as being one of the few varieties of rock pigeon known within the tropic.

GREGORY'S BRONZE-WING, which was found at the head of Sturts' Creek, must be a very fine bird, and probably extends far over the central interior, as it is gregarious, and probably migratory in its habits. I will give Mr. Gregory's description in full. "Although this pool was not 100 yards long and 6 inches deep, (Camp 33 of expedition to the S. W. from the Victoria) large flocks of ducks, snipe, and small gulls were congregated at it, and several thousand pigeons of a species new to us came to drink. These pigeons keep in flocks of ten to more than a thousand, feeding on the seeds of the grass on the open plains, as they never alight on the trees. They are somewhat larger than the common bronze-wing; the head is black, with a little white at the base of the beak and behind the eye; back, pale brown; breast, blue; throat marked with white; wings, with white tips to the feathers, and a small patch of bronze; tail short, tip white; feet dull red." STOKES' ROCK PIGEON (*Petrophila albipennis*) is a small variety, of a dark brown colour, and a white patch on each wing. It rises with a whirring sound like a partridge. This bird has only been seen as yet on the N. W. coast, near Buccaneer's Archipelago.

SMALL GAME.

There are two varieties of QUAIL (*Coturnix*) found throughout the region, one about the size of the English quail, and the other much smaller. They afford excellent practice to sportsmen, and are always fat and well flavoured. The SNIPE is also uni-

versal, but migrates during the dry season. I only know of one variety, that common to the Indian Islands. The SWAMP PHEASANT (*Centropus phasianus*) has the plumage of the bird it is named after, but its habits are those of a crow. This list might be extended by introducing the varieties of the dove, but they are generally too small to be of importance in an economical point of view, although they are so numerous, and cluster so thickly on the ground under shrubs that are shedding their seed, that upward of thirty have been secured at a single shot.

ORNAMENTAL BIRDS.

The birds classed under this heading have not hitherto been exempted from slaughter whenever a chance occurred, but their destroyers have almost always been men engaged in arduous enterprises and not over abundantly supplied with provisions. indeed often in a state of semi-starvation. But members of stock breeding establishments will be well supplied with a far better description of meat, and these stately birds (I mean the Emu, the Jabirou (*Mycteria*) and the Native Companion (*Ardea Antigone*) may henceforth be preserved. Indeed it will be worth the while of proprietors to extend their protection towards them, for the two last are well known to be dire enemies of all kinds of reptiles, (in fact snakes, lizards, and frogs are their chief food) and the Emu is more than suspected of having the same leanings, at least as regards snakes. The Emu and Native Companion are too well known to need description, but the Jabirou is rarely if ever seen to the south of the tropic. It is a gigantic crane, not quite so tall as the Native Companion, but more sturdy, and with a very powerful bill. One specimen only was obtained at Port Essington while I was there, and this was shot while it was in the act of swallowing a venomous snake that he had killed, and several other reptiles were found in his stomach. This created a diversion in favour of the Jabirou, and I do not think that another was shot, although they were often seen stalking over the meadows, as the open grass flats were called.

Tropical Australia equals if it does not excel New Guinea and the Moluccas in the beauty of its cockatoos and lorries. Every variety of cockatoo found in New Guinea is found in Australia also, except the frightful black creature, the *Microglossum aterimum*, and this is fully compensated by several varieties of the *Calyptorhynchus* of great beauty, with raven-black bodies and crest, and the large feathers of the tail bright scarlet. Lorries and Parraquets are also very numerous; but the most interesting

of all the Ornamental Birds is the BOWER BIRD (*Chlamydera nuchalis*) which constructs a bower or play-house in open but shady spots by sticking twigs in the ground and arching their tops overhead. These bowers are about 3 feet long and a foot and a half in breadth, open at both ends, and the bird, which is about the size of a jay, amuses itself by passing and repassing through it, and picking up and dropping small shells with which the floor is strewn, and which the bird must have brought from a distance. This bird is likely to be protected, as it most amusing in its habits, and is worthless as food.

SECTION III.

MARINE PRODUCTIONS.

ABUNDANCE OF ANIMALCULÆ—SHELL FISH—THE COMMON OYSTER—ROCK OYSTER—PEARL OYSTER—COCKLES, WHELKS, AND PERIWINKLES—THE BLACK CRAB—THE BLUE OR SEA CRAB—THE TREPANG OR SEA-SLUG—EDIBLE FISH—THE CAVALLA—THE SNOOK OR SEA PIKE—THE GROPER OR ROCK COD—THE SEA SALMON—YELLOW TAIL—SMALLER TABLE FISHES—THE MULLET, WHITING, ROCK FISHES—FISH TRAPS—SEA TURTLE—THE GREEN TURTLE—NATIVE MODE OF CATCHING THEM—THE LOGGER HEAD—THE HAWK'S BILL TURTLE—THE PORPOISE—THE DUGONG—FRESH WATER FISHES—THE MURRAY COD, BROAD-SCALED FISH OF THE MACKENZIE, FRESH WATER HERRING—FRESH WATER TURTLE.

The seas which wash the tropical coasts of Australia teem with animal life. The water, whenever and wherever examined is found swarming with animalculæ, which furnish food for myriads of shell fish and small fry, and these again are preyed on by the larger fishes. As the south and west coasts are very far from being so abundantly supplied, I am led to attribute the comparative richness of the tropical seas to the great Pacific Current described in the chapter on Winds and Currents, as the animalculæ are evidently generated in the open sea, and thrown upon the shores by the current. I do not think that there exists in the world so rich a field for the student of ichthyology.

SHELL FISH.

The Oyster is the most abundant among the shell fish, and is certainly the most important as an article of food. There are three varieties, the common oyster, which does not seem to differ in any particular from the variety of English oyster in general use, the rock oyster, and the pearl oyster.

The COMMON OYSTER inhabits the banks and shoals of sand and mud which are washed by the tide, but are not liable to be disturbed by heavy seas. It delights especially in the banks of outer harbours where there is about an equal mixture of sand and mud, and here it is found in such abundance that a bucket may often be filled with the oysters found in a square of 20 feet. These are rather smaller in size but better flavoured than those found in inner harbours, where mud forms the principal component of the banks and shoals. Of course this oyster is not equal in flavour to its English representative, but when properly trained and fed it is not likely to be very much inferior.

The ROCK OYSTER is met with clinging to the sandstone rocks, and clustering about the branching roots of the mangrove, which it often covers so thickly that the wood itself cannot be seen. It is scarcely more than a fourth the size of the Colchester oyster, but is exceedingly sweet and well flavoured, and many a savoury meal has been made at Port Essington from a cluster of oysters adhering to a mangrove branch, roasted by a few turns over a fire to cause the shells to open, and then eaten without bread, salt, or other condiment.

The PEARL OYSTER is so called from the shell, which is a sort of transparent mother-of-pearl, so thin that it bends between the fingers like sheets of talc. The fish itself is a thin miserable creature, utterly worthless as an article of food. Seed pearls of a minute size, but sometimes large enough to admit of being bored, are found in these oysters, but they are even more numerous in the common oyster. COCKLES abound on sand spits and sandy beaches, and WHELKS and PERIWINKLES cling to the rocks, but are not likely to be much used when superior kinds of shell fish are easily attainable. They prove very useful as bait for large fish. The BLACK CRAB inhabits the inner margins of the mangrove swamps, where it burrows under ground, and seems to resemble in its habits both the land crab and the crawfish. It grows to a large size, and was so highly and justly esteemed by the Port Essington colonists that it soon became an article of daily consumption, the natives being very skilful in digging them out, and readily disposing of them for a little rice or biscuit.

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It becomes red when boiled, like the lobster, and is by no means an indifferent substitute for that much esteemed fish.

THE BLUE OR SEA CRAB is also common, and is a delicately formed animal, with long legs and claws, and is prettily marked on the body and limbs with variegated blue and white. Its flesh is very sweet, but it was not much sought after at Port Essington, being much inferior in size and firmness of flesh to the Black Crab.

PRAWNS AND SHRIMPS are well represented, and the latter are so widely distributed that they are found even in the fresh water rivulets among the hills. They have not been much sought after as yet, but are likely to be attended to when the country becomes peopled, as the fish when dried, or made into a paste like caviar, is highly prized in all parts of China, and is extensively exported from the Malay Peninsula and other parts of the East.

THE TREPANG OF SEA-SLUG.

There are several varieties of this animal, but the most common is the edible kind, which is of a whitish brown colour, in size and appearance like a large prickly cucumber. It frequents submerged banks of mud and sand, and feeds on grass and animalculæ, and is easily taken by the Trepang Fishers of Celebes and Sumbawa who frequent the coast to collect it, by wading over the banks near the time of low water, dragging their boats with them, and when a slug is felt by the feet, it is picked up and thrown into the boat. A boat load is soon collected in this manner, and carried to the curing establishment, the erection of which, (each prahu having a separate one) is always the first operation after the vessel is anchored and made snug. The spot selected is generally a sandy beach in the neighbourhood of a belt of mangroves, the wood of which is required for smoking the trepang. The works consist of a row of shallow iron pans or boilers which they bring with them, raised above the ground on a frame of loose stones; together with a small shed of poles roofed with matting, immediately below which is a floor of split bamboo, made like the "chiks" or Indian window-blinds. The trepang, when brought on shore, are put into the boilers which will have been already half filled with salt water, and are allowed to simmer over a slow fire for about twenty-five minutes, when they are thrown out on mats spread to receive them and the process of splitting commences. This is performed by cutting a longitudinal slice down the back sufficiently deep to reach the intestines, which are taken out and

thrown on one side. The slug is then replaced in the boiler, which will have been resupplied with sea-water, several handfuls of mangrove bark being mixed with it, and is again boiled, the mass being constantly stirred by men with poles until the outer cuticle of the slug is thrown off, the boiling generally lasting about three hours. The slug is then again thrown out on the mats and allowed to drain, and when sufficiently cool to be handled, is carefully spread out, with the open part downward, on the lattice floor of the drying house, and a fire of mangrove wood from which the bark has been peeled is lighted below it, and kept up until the slug is perfectly dry and fit to be packed in baskets. It has now become the trepang of commerce, and will realise about half a crown a pound in China if not injured on the voyage; but much care is required, and it has to be taken out of the baskets and dried in the sun whenever it becomes damp, and often has to be smoked a second time after the fishers have reached their homes.

THE CAVALLA.

This is a very handsome fish, rapid in its movements, and delighting to leap clear out of the water, with its silvery sides glancing in the sun-beams like rays of light. It has a high forehead, rising straight upwards from the mouth like the stem of a cutter, and then curving suddenly backwards towards the body, which is short, but deep and tapering gradually towards the tail. In fact it is a perfect model of speed and strength. The back is a blueish grey colour, and the sides and belly silvery white. There are several varieties of this fish, or at least several sizes, from four feet in length and weighing 12 to 15 pounds to the size of a minnow, but so alike in form and colour that it has not yet been determined whether or not it is the same fish at different stages of development. It is an exceedingly bold-biting fish, easily caught with the hook, and so numerous, that on hauling the seine-net on sandy beaches the cavallas generally furnish three fourths of its contents. Its flesh is firm and exceedingly well flavoured, and when salted and smoked, is scarcely inferior to that of the preserved haddock. It is found throughout the tropical coasts, but is most numerous, I think, to the westward of Torres Strait. This fish is covered with scales, but these are so minute that it is generally held to be a smooth-skinned fish.

THE SNOOK OR SEA PIKE.

This fish runs from three to five and sometimes six feet in length, with a long but thick body, a pointed head, and long

and narrow jaws, armed with sharp, and widely separated teeth. It is a dark coloured fish, and like the Cavalla, has very small scales which can only be detected on close examination. It has been caught on the south coast in the neighbourhood of King George Sound and Cape Leeuwin, on the west coast at Garden Island, in Torres Strait, and in the neighbourhood of Port Essington, and I think it will be found everywhere on the Australian coasts, and in numbers that are at present scarcely contemplated; for it is a fish that does not show itself by leaping out of the water like the Cavalla, and its existence can only be ascertained by actual experiment. For example, I twice passed through Torres Strait by the inner passage without having the slightest suspicion of its presence, but on the last occasion, in the ship *Monarch* conveying Mr. Gregory's party to the N. W. coast, it struck me when at Moreton Bay to procure materials for sea fishing on the Malay principle, namely cod-hooks and lines, and copper wire of the size of ordinary bell-wire, eight or ten feet of which are necessary to snood the hook with, partly on account of the sharp teeth of the fish which cut a common fishing line like a pair of scissors, and partly because the wire renders the connection between the line and the hook almost invisible when towed through the water. I put the line over the day after leaving Moreton Bay when passing Break Sea Spit, and in the course of half an hour a snook three feet long was hauled on board. Several others were caught while passing through the Inner Passage, the bait being a bunch of cock's feathers;—but they seem to be indifferent as to the bait, so long as it resembles a fish, for they can only be caught when the vessel is going fast through the water, and then almost any towing bait will look like a fish. Indeed it was an attack made on a former occasion on the brass spindle of a patent log that was towing astern, and which left deep scratches and indentations in the metal, that led me to try the experiment. As the snook is known to be gregarious, the presence of one argues the presence of many. This fish is rather dry when cooked fresh, but it is nearly equal to the cod or ling when well cured. It resembles the Barracouta very closely in its habits and character, but is much larger in size. The Barracouta abounds on the south coast, more especially in Bass's Strait, where it is caught in large numbers by the crews of coasting vessels, a piece of stout wooden lath, with a curved nail driven through it being used both for hook and bait. It is caught only when the vessel is going fast through the water. This fish is not often met with on the tropical coasts.

THE GROPER OR ROCK COD.

The fish is solitary in its habits, and frequents detached patches of rock (not coral) where it feeds on shell fish, and a sort of marine vegetable or semi-animate substance, and I think also on the trepang or sea-slug. It takes the bait at once when it comes in its way, and allows itself to be dragged into the boat without a struggle. It is indeed a sluggish creature and very ungainly in appearance, being short and thick in the body, with a monstrous head and mouth, and skin of a muddy black colour, rather lighter about the belly. But in the opinion of many, and I must confess myself one of the number, it is the most delicate and well flavoured fish found in these seas. Although it sometimes attains the size of twenty eight pounds, (and is even larger, I am told, in the West Indies, where it is called the "Jew-Fish") its flesh is never in the least degree coarse. Its only fault seems to be that it is too rich to be used as daily food, indeed some can only eat it after it has been cut in flakes and grilled on the live coals, when the fat oozes out and is burned into a delicate brown crust. This is a large-scaled fish.

THE SEA SALMON.

This fish is not unlike the Salmon in shape, and is I think, called elsewhere the "King Fish." It is so secret in its habits that seas in which it abounds may be visited for years without its presence being detected. It also frequents detached patches of rock, like the Groper, but is gregarious, and much more active in its habits, the same shoal of fish visiting several patches of rock, often distant from each other, during the same night. It is a handsome fish, of a blackish brown colour, with very large scales, and runs from 10 to 35 pounds in weight. The flesh is white and delicate, and very nearly equal to that of the Groper, indeed some think it preferable, as it is not so rich, and can be eaten for days in succession without tiring the palate. This fish was first discovered by accident, when the decked-boat belonging to Port Essington was lying at anchor during the night to await change of tide, close to a sunken sandstone rock off Table Head in the outer harbour. A hook having been put over by way of experiment was immediately seized by one of these new fishes, and the boat returned to the Settlement in the morning nearly loaded with them.

The Salmon was found afterwards off the rocks near Point Smith, and in other localities, but the Table Head Rock became the only fishing ground habitually used, and the boat never re-

turned empty. The practice was for one or more of the officers who were desirous of a change to give notice to the garrison that the decked-boat would start about gun-fire in the evening for the fishing ground, when the number of volunteers required would be forthcoming immediately, generally a man from each mess who happened to be well skilled in the use of hook and line being chosen. The boat usually reached the fishing ground about ten o'clock, and sometimes the bait, a shell fish, would be taken the moment it was put over the side. At other times the fisher might have to wait an hour or two until a shoal came past, but when once they began to bite, they were hauled on board as fast as the lines could be baited and put over the side. The work, however, was often interrupted by the fouling of lines, for this fish did not take the matter so easily as the Groper, but commenced rushing about the moment it felt the hook, generally running out many fathoms of the stray line, and one may imagine the confusion likely to take place when five or six fish were hooked at once. The struggle however did not seem to frighten the others, as the bait would be taken as freely as before, after order had been restored. Their feeding time seemed to last four or five hours, after which the shoal took its departure, not to return, I suppose, until the following night. Nothing beyond this is known of the habits of the Sea Salmon, but I have no doubt that attempts will be made to learn something more about them as soon as the country becomes occupied. I think it tolerably certain that this fish will be found throughout the north coast in localities suited to its habits, for the natives, although they seem never to take it, are acquainted with it from dead specimens washed ashore;—and it is even possible that it may be found in sufficiently large numbers to support a regular fishery. When salted and dried it is no way inferior to the cod. Vessels with native crews almost invariably stayed a night at Table Head to fish, and the quantity caught sometimes proved sufficient for the supply of the crew with salt fish until her return the following year.

This fish resembles very closely in its habits the snapper of the south and west coasts, and may be considered its representative on the coasts influenced by the Equatorial Current, where the snapper is only occasionally met with.

THE YELLOW TAIL.

This fish is a tunny, and the only one of the kind that enters harbours, the Albacor and Bonita keeping to the open sea. It is a long, narrow fish, but deep in the body about the centre,

and exceedingly swift and voracious. Average length from eight to twelve feet. Its colour is yellowish white; variegated with blue about the back and tail, and fins of a yellow colour. Its skin is smooth and scaleless. It is exceedingly voracious, and attacks anything that may be towing astern of a vessel which bears the slightest resemblance to a fish; log-ships, and the brass spindles of the patent log, being especially liable to attack. Its flesh is dry and insipid, but takes the salt well, and is much esteemed by sea-faring people when in a dried state. This fish wanders about in small groups of ten or a dozen, and its movements are not to be depended upon. It is not likely therefore to become the object of an established fishery, which may be the case with the Cavalla and the Salmon.

SMALLER TABLE FISHES.

The MULLET frequents the quiet salt-water creeks, where it swims about near the surface, and is easily speared by the natives. It will not take a bait, but I think it might rise to a fly if it were possible to throw one in mangrove lined waters. It is a well-flavoured fish, but many prefer the kinds of fish which feed only where the bottom is sandy.

WHITING, and GUARD FISH are found throughout the coast, the former only where the bottom is sandy, and are caught with the seine net. The Guard Fish, which is distinguished by a long projecting nose, is more ubiquitous, and readily takes a bait near the surface, but must be fished for with a rod.

The smaller ROCK FISHES are so numerous that only the more important kinds can be noticed. The most common is shaped like the groper, with an ugly, toad-like skin, but very delicate flavour. It varies in weight from a few ounces to three or four pounds. Another kind resembles the Perch in shape, and is also well flavoured. They readily take a bait on or near the bottom, but are most easily caught in the fish-traps of the Macassar people, which are baskets of split bamboo, eight feet long, and shaped like the old fashioned, round-topped, leather trunks, open at one end, into which a tapering tube, also of basket work is inserted. At the far end of the tube which is closed, there is a hole opening downwards by which the fish enter the trap, but by which it seems that they do not escape, as the hole cannot be seen from the inside owing to the basket work of the frame above which appears to close it. At all events it is a most successful contrivance, and when laid down overnight in 2 or 3 fathoms water near a patch of rocks frequented by fish, it is nearly cer-

tain to be found occupied in the morning, sometimes as many as twenty fish being taken at a time. The trap is sunk by four stones, one attached to each corner, and is carefully lowered from the boat by a line fastened to the upper part of the trap in such a manner that it retains a horizontal position when being raised or lowered. A buoy of bamboo is attached to the other end of the line, and the fish are easily taken out of the trap by placing it across the gunwale of a boat, still in a horizontal position, and removing a door in the bottom near the centre, through which the fish fall into the boat. This is one of those simple contrivances the importance of which can only be appreciated on actual experience. A single trap supplied the breakfast table of the officers mess at Port Essington with a dish of fish for many months, and it was generally remarked that the supply was most abundant during bad weather. I shall have occasion to describe the fishing-weirs of the Malays and Chinese, by which large communities of fish consumers are abundantly supplied, in another part of this handbook.

I have as yet said nothing about the fish found near the coral reefs, indeed they are not likely to be of great service to colonists, the reefs being generally at too great a distance from the shore. The ponds left on the reefs by the retiring tide are often well supplied with small fish of beautiful colours, but which are not easily caught with nets on account of the rugged nature of the rock. The smaller fish often bite freely close to the edge of the reef, and the parrot fish especially are very well flavoured, but some of the varieties caught in these localities are of a poisonous nature, the thought of which materially impairs the pleasure of a feast on coral fish.

SEA TURTLE.

There are three varieties of sea turtle common on the coast, the Green, the Loggerhead, and the Hawks-bill. The two first are gregarious, at least about the time when they deposit their eggs, but the Hawks-bill variety is rarely seen in companies of more than two or three together.

The GREEN TURTLE, the most common variety, is identical in every particular with that often to be seen in the confectioners shops in London, and is so numerous that it is rare to make a boat excursion of even a few miles without seeing two or three specimens. The natives often catch the smaller ones in the shoal water by striking them with their common fishing spears, but full grown animals require rather extensive preparations. First, a

barbed peg, four inches long, of iron if it can be obtained, and of wood hardened in the fire if iron is not procurable. The end of a long line of twisted hibiscus bark is securely fastened to the shank of the peg about 3 inches above the barb, and the upper end of the shank is fitted into a socket, half an inch deep, cut into the end of a light pole 9 or 10 feet long. The process of catching the turtle is so singular that I should hesitate to describe it had it not been witnessed by several gentlemen attached to the Port Essington settlement who at times accompanied the fishers for the express purpose of seeing the sport. The boat used is a long narrow "dug out" canoe, in which the fishers, always two, take their places, one at each end. If an amateur is admitted, which is never without great persuasion, he is seated in the bottom of the canoe about the centre, and strictly enjoined not to move or speak after the turtle is seen. The fishing ground is one of the shallow submerged banks on which the turtle feed, where the depth is not more than two or three fathoms. As soon as a turtle is seen, the fisher in the bow stands up and fixes the peg in the *Oringa* or shaft, and afterwards remains upright, paddling as he stands. If the turtle allows the boat to approach sufficiently near, the harpooner, who has been standing for some time with the shaft and line held in both hands, and the peg directed towards the turtle, springs out of the boat, and drives the peg with the whole weight of his body into the back of the turtle. Down goes the turtle, taking out the stray line very rapidly, and in a second or two, up comes the harpooner, with the shaft in his hand, springs into the boat without listing it more than an inch either way, and both fishers commence paddling in the direction the turtle is swimming so as to take the strain as much as possible off the line. At this time they commence a sort of song or incantation of a single syllable uttered so rapidly as to be inimitable by an European, and which is discontinued the moment the turtle re-appears above water, when the harpooner fixes a second peg with line attached into the shaft, and the same process of jumping out is repeated at the first opportunity. When the second peg is fixed, the turtle is considered secure, and is allowed to tire itself out, an equal strain being kept on both lines;—and if a Green or Loggerhead turtle is the victim, his exhaustion is accelerated by probing with a fishing spear, which is always carried for the purpose. When sufficiently exhausted the turtle is dragged into the boat and carried on shore in triumph.

The female turtle lays her eggs during the prevalence of the N. W. monsoon, and the season terminates about April. At

104 *The Hawk's Bill Turtle—The Porpoise—The Dugong.*

this time they congregated in large numbers about certain favourite spots, generally on sandy islets or sandy beaches open to the sea. The Loggerhead and Hawk's Bill Turtle frequent the same laying ground as the Green Turtle.

The **LOGGERHEAD TURTLE** closely resembles the Green variety in its habits, but is less often seen in land-locked waters. Indeed I suspect that its chief *habitat* is the open sea, and that it only frequents the immediate neighbourhood of the coast in large numbers about the time for depositing its eggs. It has a large ugly head, and its flesh is thought to be coarser than that of the Green Turtle.

The **HAWK'S BILL TURTLE**, which furnishes the tortoise-shell of commerce, is more wary than the others, and gives more trouble in securing it after being harpooned. It is sufficiently numerous to attract occasional prahus of the Baju Laut or Sea Gypsies from Celebes and Sumbawa, which visit the coast for the express purpose of catching them, at which the Badju Laut are very expert. Large nets are employed, as well as the peg and line, the latter however being rarely used except to secure individuals that have escaped by breaking through the nets. The flesh of this turtle is not so good as that of the others, and is sometimes actually poisonous. The natives often suffer severely from eating it, and are sometimes absolutely poisoned to death, yet such is their craving for food that they rarely abstain when it comes in their way. The chief victims are unweaned babies, the flesh having the power of imparting poisonous properties to the milk of mothers who have eaten it freely, without seeming to injure the mothers themselves.

THE PORPOISE.

There are two varieties of this creature, one nearly black and the other of a whitey-brown colour, but having the same habits. They are only valuable for the oil obtainable from their livers and intestines, but the natives esteem their flesh a great luxury, and often kill them with peg and lance in the same manner as the green turtle; but the contest lasts much longer, and the canoe is often dragged many miles before it ends.

THE DUGONG.

This singular animal is only known to exist in considerable numbers in Van Diemen Gulf, but it is likely to be found in other localities when the coasts come to be better known. Europeans seem indisposed to molest it, its fondness for its young, and other semi-human habits having enlisted their sympathies;

—but the natives have no scruples, and kill it whenever they can, being very fond of its flesh, which they hold to be superior to fresh pork. The Dugong has two tusks projecting downwards from the upper jaw like those of the Walrus. The natives say that it hooks these into the lower and matted parts of the grass which grows at the bottom of the sea, to keep its body from floating up, while it feeds on the tender tops. This seems rather fanciful, but it may possibly be the case.

FRESH WATER FISHES.

Very little is known about the river fishes of the tropical region, but that large fishes exist in the deep pools of all the important rivers discovered by Leichhardt is evident from the repeated mention he makes of their splashing during the night. A lagoon several miles in length running parallel with the Lynd River is described as "well stocked with numerous large fish, which betrayed their presence by an incessant splashing during the early part of the night" (*Journal* p. 293). At the upper part of the Roper River he observes "large fish were splashing in the water;" (p. 451): and at the South River of Van Diemen Gulf, when he first came upon it, far in the interior, he makes a similar remark. "Large fish betrayed their presence in the deep water by splashing during the night." (p. 486.) This is very likely to be the same fish as the Cod of the Murray River in New South Wales which has the same propensity, for all the known varieties of fresh water fish in Australia are very widely distributed. For example the broad-scaled fish of the Mackenzie River, at the verge of the tropical region on the east coast, was caught in the Lynd by Leichhardt's party; (*Journal* p. 293), and one of four pounds weight was taken in the upper waters of the Roper River. Unfortunately, however, none of the splashing fish were caught, which would have decided the question at once, as Leichhardt must have been well acquainted with the Murray Cod. A kind of pike and several varieties of the perch were also caught in the Lynd, together with the *Silurus* and Guard Fish, but the two last are sea fishes. The fishes noticed by Mr. Wilson, the Geologist to the N. W. expedition, in his paper on the Victoria River given in the *Geographical Society Journal* are also sea fishes. I have very little to add from my own knowledge, as there were no large fresh water rivers in the parts where my personal experience chiefly lies. A fish not unlike the herring in shape and appearance, but rather thin and bony was numerous in the lagoons and fresh wa-

Fresh Water Turtle.

ter streams of the inland parts of the Cobourg Peninsula, and I have often caught them with a shrimp taken out of the same water as a bait. This fish is also found in the interior of New South Wales, and is so enduring that it will live for months buried in the moist earth of the bottom of the lagoons after the surface water has evaporated; and it struggles into freedom when the rains have filled the lagoons, to enjoy a new lease of life.

The FRESH WATER TURTLE, weighing 6 or 8 pounds, is the only other inhabitant of the fresh waters of the Cobourg Peninsula that is deserving of notice. It abounds in the deep pools, and was often brought in by natives for the consumption of the garrison, but it was not very generally esteemed, its long snake like neck and head giving it a forbidding appearance. I have not seen it mentioned in any of the journals of the inland explorers, but it is common in the interior of New South Wales, and I have seen many specimens of the same variety in the fresh water of the Swan and Blackwood Rivers of Western Australia.

SECTION IV.

MINERALS AND WATER SUPPLY.

RED SANDSTONE—LIMESTONE—BRICK EARTH—ROAD METAL—SALINE DEPOSITS—WELLS—RESERVOIRS.

USEFUL MINERALS.

RED SANDSTONE, closely resembling in character and appearance that found underlying the coal measures of England, is universal, and often the only description of rock throughout large tracts of country. It will answer well for foundations, but is too rough and unsightly to be generally esteemed for building purposes. GRANITE has only been found upon the north coast near the sea in two localities separated by a distance of more than 400 miles, namely at Port Darwin, and at Melville and Caledon Bays near Cape Arnhem;—but on the N. E. coast it occurs more frequently, spurs from the dividing range coming down to the sea shore at intervals throughout its length. In the interior it is more common, all the great dividing ranges being partly composed of it.

LIMESTONE is even less accessible than granite, for although where it exists, it is sufficiently abundant, these spots are generally far inland;—for example on the western slopes of the N. E. coast range; in the interior of Arnhem Peninsula; and on the dividing ranges which bound the valley of the Victoria to the north-

108 *Limestone—Brick Earth—Road Metal—Saline Deposits.*

east and southwest. Its absence near the coast will not, however, be severely felt, as coral rock abounds there, which is easily converted into excellent lime.

BRICK EARTH will have to be sought, not among the fine clays, the beds of which are often far inland, and remote from fuel, but in the soil of the mangrove swamps, which makes excellent bricks, superior indeed, in my opinion, for common purposes, to those made of upland clay. This soil, which is a sort of stiff mud, has the peculiar property of hardening to the consistence of cement when dug out, formed into blocks, and dried; but of course it is liable to be injured by rain if not burned. This property was first discovered by the circumstance of a "dug-out" canoe having been lost, and found a month or two afterwards among the mangroves, half filled with mud, which had hardened to such an extent that a pickaxe had to be used to clear it out. The same thing occurred to H. M. S. *Pelerus*, which was driven ashore during the hurricane, and was nearly half filled with the mud of the harbour.

The wood of the mangrove tree furnishes the very best description of fuel for burning bricks.

ROAD METAL of good quality is exceedingly scarce, trap rock being only accessible at two or three spots far removed from each other, and these are distant from the great lines of communication with the south from the Victoria River and Carpentaria. The red sandstone of the coast, and the limestone of the interior, will, however, prove tolerable substitutes, and if rail roads are laid down on the main lines of communication, which has already been proposed, there need be no difficulty about the cross roads.

SALINE DEPOSITS.—In the neighbourhood of the salt lakes which abound in the interior, the soil is generally so impregnated with salt that incrustations to the depth of three or four inches are often formed on the margins of the lakes as the water evaporates during the dry season. This can generally be used in its natural state, but when required for salting provisions it should be refined, as the process is very simple and inexpensive. A quantity of the saliferous earth is placed on a piece of sacking stretched on a frame, the four corners of which are supported by posts three or four feet high, and water from a tub placed below the sacking is poured over it until all or the greater portion of the salt has filtered through into the tub. The water is then evaporated by boiling, and the pure salt is obtained as a residuum. The same process is applicable to soil impregnated with sea water, which will of course be available to all who dwell near

the coast. Some large natural deposits of salt have been found in different parts of the coast, and Leichhardt describes one near the head of the Gulf of Carpentaria where he "found the bed of a creek one mass of the purest and whitest salt. Lumps of it had crystallized round stems of grasses which the wind had blown into the water. A little higher up the creek, a large pool of water was full of these lumps, and in less than ten minutes we collected more than sufficient to supply us for the rest of the journey." (*Journal*, p. 346.)

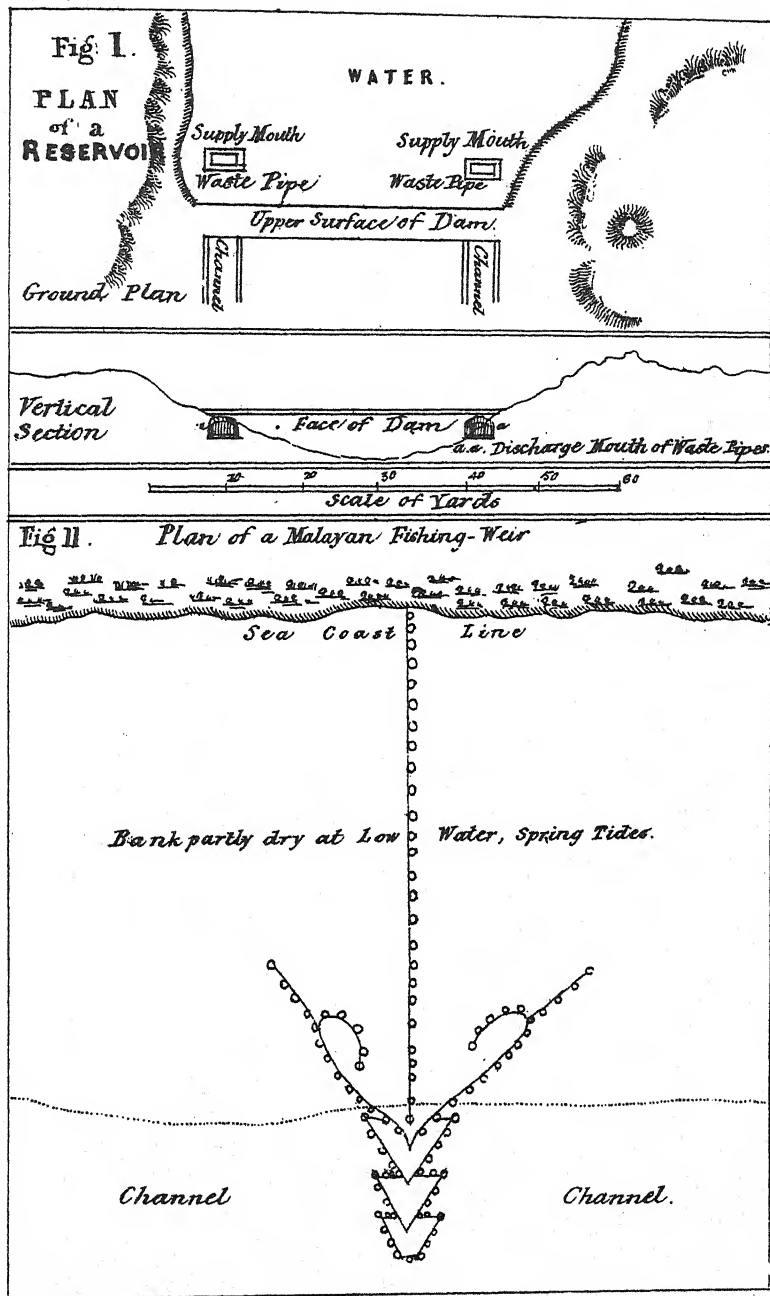
FRESH WATER.

As a general rule, fresh water is more easily obtainable near the sea shore than in the interior, for where the beach is sandy, backed by rising land, it can generally be procured by digging to the depth of a few feet a little above high water mark, indeed when the sea is perfectly smooth, drinkable water is sometimes found by scratching a hole in the sand immediately above the point reached by the salt water. The tropical coasts of the continent are not peculiar in this respect, as the same phenomena occur on the west and south coasts. It seems that the rains which fall near the coast, and are not carried off at once by the water-courses, are held in suspension by some unexplained cause when they have penetrated the soil to a depth corresponding with the level of the sea, and then gradually drain off seaward. It is at least certain that the wells sunk at Port Essington, whether near the beach or on the uplands, invariably corresponded in depth with the height of the surface above the sea-level, at which point the water oozed in rapidly, while above it the soil was perfectly dry;—and as far as I have been able to ascertain, the same features were observed by the officers of surveying ships employed upon the coast, who had sometimes occasion to sink wells to supply the crew with water. It is indeed only on the table lands of the interior, after the surface water has evaporated or been absorbed, that a deficiency of water is likely to be experienced, and here it may be found necessary to form reservoirs by throwing dams across small valleys on hill sides, and which are likely to be filled by the first thunder storm that occurs after the dam is completed. The earth collected in the neighbourhood, (for of course these reservoirs can only be formed over a stiff soil) is alone required for the dam, and it will last for many years if a simple precaution is adopted which I shall endeavour to explain by a diagram (Plate III. Fig. 1), and the efficacy of which will be at once admitted by those who have had experience in this

kind of work. The precaution consists of a waste pipe at each of the lower corners of the reservoir, the mouths of which must be unconnected with the dam and distant from it at least 3 or 4 yards. The entrance or mouth of the waste pipe will be in the form of a well, which need not be more than a few feet deep, with the rim at least a foot lower than the level of the dam. An arched culvert leads from the lower side of the well, which should be square or oblong, and passes through the dam, the roof of the culvert being about three feet below its level. Slabs of stone are the best material for the waste pipes, but strong timber has been found to answer when stone was not at hand; but in all cases it will be necessary to have a slab of hard stone at the bottom of the well to resist the force of the water as it pours over the rim. If the waste pipes are sufficiently large to carry off the waste water, and they are well constructed, the dam cannot possibly be injured by floods.

I should mention that I first saw this plan in operation on the Alma Estate in Province Wellesley, where a reservoir had to be formed for working the machinery. Here there is only one waste pipe, as a second would be inconvenient on account of the works, and it is made of timber; but although in this rainy region, where floods occur at all times of the year, the waste pipe has been in almost constant use during the last five years, it shows as yet no signs of weakness, and is likely to last many years more. But stone is so much better suited for the purpose that it would be worth while for settlers whose stations are near the coast to import granite slabs from China. Slabs of this material a foot in breadth, six inches in thickness, and from four to eight feet in length, have long been an article of import from Amoy to the Straits Settlements, and can be purchased in the markets at the rate of 12 cents or sixpence the running foot. By sending an order to a firm at Amoy, the slabs could be obtained of the exact length that might be required, when the construction of the waste pipes would be a comparatively simple operation.

PLATE. III.





SECTION V.

ABORIGINES.

UNIFORMITY OF CHARACTER AMONG THE ABORIGINES OF AUSTRALIA—POPULATION OF THE TROPICAL REGION—CAPACITY FOR LABOUR AS FISHERMEN, BOATMEN, WOOD-CUTTERS, AND FOREST RANGERS—EMPLOYMENT IN THE MOUNTED POLICE FORCE—THEIR GENERAL CAPACITY.

There is no other tract of country in the world of equal extent to the continent of Australia in which so great an uniformity exists in the characteristics of the native tribes. In the island of Van Diemen Land the natives are, or rather were, genuine *negritos*, or diminutive negroes, differing very slightly, if at all from the Andaman Islanders and the Semangs of the Malay Peninsula; while at Melville Island, on the opposite side of the continent, the natives have many of the characteristics of the gigantic Papuans of New Guinea;—but on the continent itself there is no tribe having peculiarities that would enable even the most experienced European to detect from mere personal observation whether any particular individual brought under his notice was a native of the northern, southern, eastern or western division of the continent. This is partly attributable to the wandering habits of the natives, it being rare to meet with a middle aged man who has not at some time or other visited all or most of the tribes, which abut upon his own;—but the chief cause is the universal custom that prevails of the males obtaining wives, either

by fair means or the contrary, from neighbouring tribes in preference to their own;—a custom presenting a remarkable contrast to that which obtained among the native tribes of Borneo, where the men intermarried only with the women of their own tribe, but each had to encompass the death of a stranger before he became eligible for matrimony. Neither of these customs would have prevailed had their respective countries been infested by beasts of prey, which would have restricted their wanderings, forced them to dwell together in villages for mutual protection, and in the end have led to a partial civilization. But we have only to consider the aborigines here as they stand in relation to settlers, and how they may be brought to aid in the progress of colonization, instead of being considered as pests, which is too often the case with those who have not the tact or patience to turn them to account.

The natives are more numerous in the neighbourhood of Van Diemen Gulf than on any other known part of the continent. The north coast, from the Cobourg Peninsula eastward is also comparatively populous, and the southern shore of the Gulf of Carpentaria, more especially the neighbourhood of the Roper and Limmen Bight Rivers, is well peopled. But in the interior, except in two or three spots where nature has been liberal in providing substitutes for the articles of subsistence so liberally supplied by the waters of the sea, the natives are few and scattered,—indeed it may be doubted whether there is any single tribe in the tropical region of Australia which dwells exclusively in the interior, those met with even far inland being often members of coast tribes who have made a distant excursion to enjoy some edible production which becomes abundant in particular seasons, such as the seeds of the panicum, or bread-gross, and the seeds and roots of the nymphaea. As the natives live literally from hand to mouth, making no provision for the future, the amount of population is of course restricted to the number that can find subsistence in the most unfavourable seasons.

Our experiences at Port Essington tended to show that they fully appreciated regular supplies of food, and had the settlement been maintained until the present time, nearly all the youths and middle aged men would have become hired labourers for at least the greater portion of the year;—for although at that time there was little employment for them except as fishermen, boatmen, and domestic servants; the great demand that has arisen in India for supplies of hard-wood timber for railroads and other public

works would have led, long before this, to extensive operations in the forests. This is a kind of work for which the natives of that neighbourhood have already proved themselves to be well suited, and as it would have become worth the while of their employers to keep them well supplied not only with rice, but with the highly esteemed luxuries, tobacco and coarse sugar, their constant services would have been secured except on very particular occasions, when general assemblies of the tribe take place, which the labourers would find it necessary to attend. Indeed timber-cutting establishments on a large scale, superintended by men of character, would prove a boon not only to the natives but to colonists engaged in pastoral pursuits, who could only give employment to a few of the natives and who would be rendered much more comfortable by the remainder being kept out of the way.

There will always be employment for two or three natives about a large establishment in assisting the stockmen in tracking stray horses and cattle, and moreover the system of employing aborigines as a mounted Police Force under white officers has proved so successful in New South Wales and Queensland that it is almost certain to be introduced throughout the tropical region when it comes to be occupied. The aborigines will also be found useful as boatmen, fishermen, and procurers of game, indeed the same individual generally proves a proficient in all three capacities. Of course they will have to acquire a knowledge of our mode of proceeding in such matters, but they require no laborious instruction, as their powers of observation and facility of imitation are so great that they learn a simple handicraft by merely watching others perform it. Several of the natives learned to take a gunlock to pieces, clean it, and put it together again in perfect order by only watching one of the marines perform the operation once, or at most twice. Their facility in acquiring our language is also great, indeed some of the young natives became such proficient, that a stranger hearing one of them hold a conversation in another room where he could not be seen, would suppose that the speaker was a half educated young Englishman. Lest it should be supposed that I may be prejudiced in favour of a people with whom I was closely associated for several years, I will refer the reader to Commodore Keppel's narrative of the voyage of *H. M. S. Mœander*, the ship that took away the garrison in 1849, where some very interesting details respecting the settlement will be found.

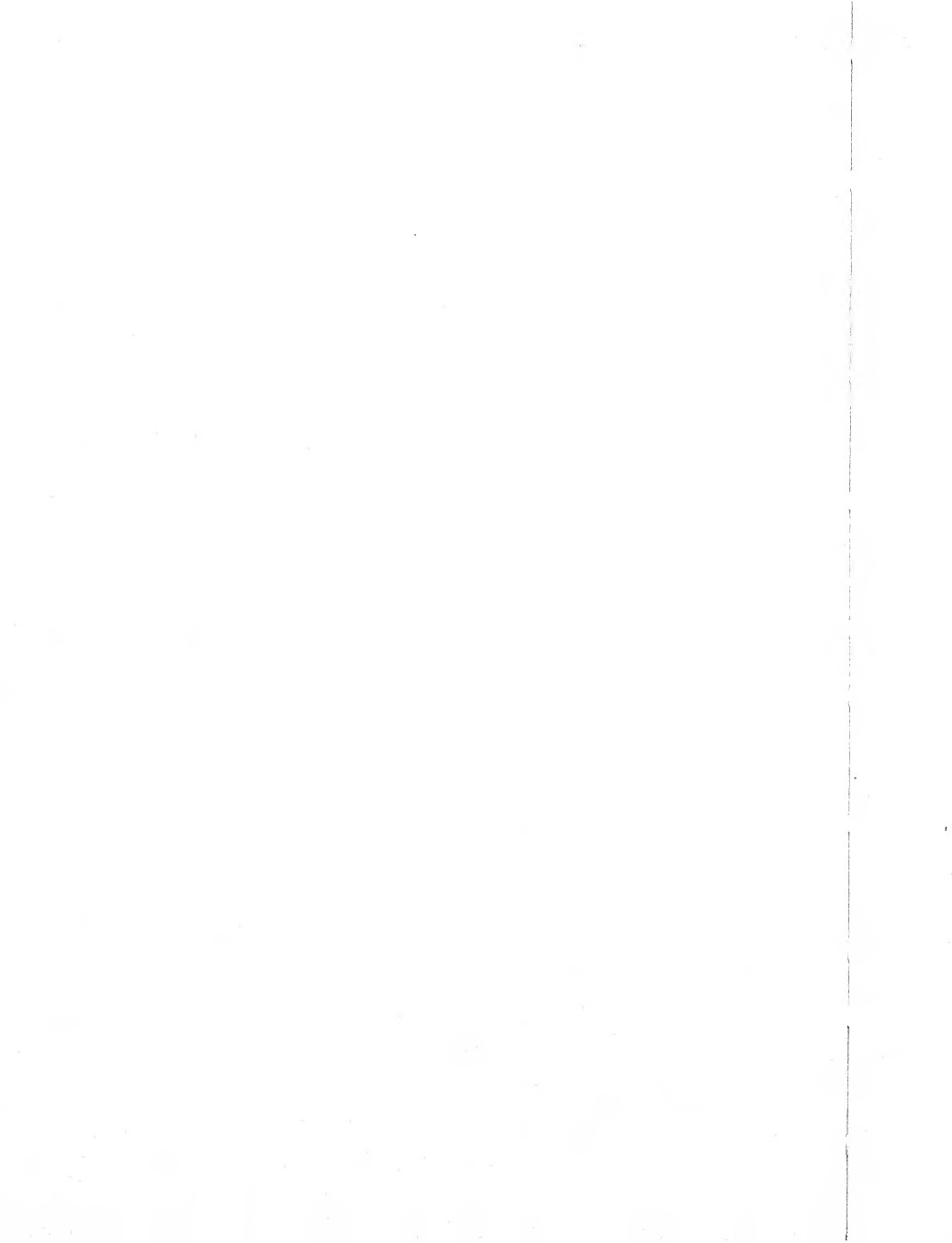


PART III.

DESIDERATA.

SECTION I.—DOMESTIC ANIMALS.

- „ II.—THE CAMEL.
- „ III.—GRAIN, FRUIT, AND GARDEN VEGETABLES.
- „ IV.—THE COCONUT PALM.
- „ V.—THE DATE PALM.
- „ VI.—THE NIPA PALM
- „ VII.—THE SAGO PALM, COFFEE, COTTON, SUGAR-CANE,
CACTUS, AND ALOE.
- „ VIII.—THE TEA PLANT.



SECTION I.

DOMESTIC ANIMALS.

CATTLE—COLONIAL BREED—IMPORTED BREEDS—THE ZEBU OF JAVA AND THE MALAY PENINSULA—HORSES—AUSTRALIAN BREED—ISLAND BREEDS—GOVERNMENT BREEDING STUD IN JAVA—CROSS-BRED STOCK IN JAVA—THE GLUGOR BREED OF PINANG—ORIGIN OF THE ISLAND BREED—THE HORSE OF SUMATRA AND TIMOR—THE SUMBA OR SANDALWOOD ISLAND BREED—SUMBAWA AND BIMAH PONIES—THE JAVA BREED—THE MACASSAR BREED—SHEEP.

CATTLE.—I am of opinion that horned cattle will, in the first instance, prove the greatest source of profit to colonists in Tropical Australia. Cattle thrive so well on the grasses;—do not appear to be affected injuriously by the climate;—and are so well able to preserve themselves and their young from the attacks of native dogs and Aborigines, by which alone they are liable to be molested;—while at the same time the surplus stock can be disposed of so readily as working bullocks, for export as live stock to the neighbouring countries, or by salting them down for ship's provisions; and even if these demands should fail, a handsome profit could always be realised by boiling them down for tallow, a process that had become general throughout the southern colonies before the gold discoveries caused a great demand for butcher's meat, and which has never totally ceased up to the present time.

Upwards of a hundred head of cattle were brought to Port Essington from Sydney by sea during the existence of that esta-

blishment, but only nine of these were females, namely a cow belonging to Sir Gordon Bremer which came in H. M. S. Alligator when the settlement was first formed, and eight heifers purchased by Government from the improved herds of Mr. James Macarthur of Camden, which came up under my charge when returning to the settlement in 1843, and all of which produced calves a few months after landing. The remainder, with the exception of a single bull, consisted of steers or bullocks which were either killed for fresh provision, or were used as working cattle in the settlement. The cows and the working bullocks were always in good condition, although the latter were fed chiefly on hay, only getting a few bites of green food occasionally, and I cannot call to mind a single case of death from natural causes occurring among them. All the breeding cattle were left behind to stock the country when the settlement was abandoned in 1849.

The breed of cattle common in the Southern colonies, which came originally from England and the Cape, is equally well suited for the tropical region, and appears to be the best adapted for ordinary purposes, as young steers are easily broken in to the yoke, and a few weeks run on good pasturage will bring them into condition for exportation as live stock. If the demand for milch cows in the European Settlements of Eastern Asia and the Indian Archipelago proves as great as it is likely to become, it will be worth while for breeders to import males from Europe of the varieties best suited for the dairy, such as the Alderney and Short-horn breeds; but experience can alone determine which will prove best suited for the tropical region. The Asiatic breeds of cattle are all bad milkers, and will not even yield the small quantity of milk they produce unless their calves are at their side. They are nearly all of the Zebu or humped kind, and I do not know a single variety the introduction of which would be otherwise than injurious, if the imported animals were allowed to mix with the European cattle. There are two varieties of the Zebu existing in the Indian Islands, one of which is peculiar to Bali and Lombok, and came, I think, originally from Siam. It is larger, and perhaps more hardy than the Zebu of Java and the Malay Peninsula, but its meat is not much esteemed, having a disagreeable musky flavour; and it has a curious triangular white patch on the rump, not unlike that of some varieties of the antelope, but, upon the whole, the Bali ox does not bear so close a resemblance to the latter animal as can be claimed by the smaller variety of the Zebu,

which, when young, might easily be mistaken for an antelope if met with running wild in the forest. This is the kind common in the Malay Peninsula and in the islands of Java and Madura. The following description by M. Van Hogendorp in his "*Coup d'Œil Sur l'Isle de Java*," applies equally to the breeds of Java and the Malay Peninsula, but those bred on the Island of Madura and on the uplands near the neck of the Malay Peninsula, where there is a good deal of open country and tolerable pasture at times, are superior to the others, and their flesh has something of the taste of English beef:—

"The Javanese set little value on the bull and the cow; it is only in some districts of the interior that these animals form part of the rural economy: in the island of Madura, in the residencies of Passarouang, Pakalongan, and in some of the Preanger Regencies, they succeed perfectly. The cattle coming from one of the provinces in the district of Bandong are generally finer and in better condition than those belonging to European colonists near Batavia, where, however, the most numerous herds are found: several enterprising proprietors in the residencies of Batavia and Baitenzorg possess from 600 to 800 head of cattle, from which they derive great profit, not only from the sale of milk and butter, but by supplying the butchers of the capital with live stock. In general the cattle of Java are small and miserable (*chétives*); at all times efforts have been made to improve the breed by importing bulls from Bengal, the Cape, New Holland, and even from Europe. A cow of the cross breed between an European bull and a native cow will yield five or six pints of milk every day, which is four times the quantity given by a native cow." (p. 210).

HORSES.—There can be no doubt whatever as to the capabilities of the tropical region for producing horse stock of the very best description. With abundant pasturage, large tracts of open country on which the young animals can exercise their limbs with freedom, and a climate closely resembling that in which the best breeds known in the world are produced and flourish, nothing but neglect and want of precaution in the selection and breeding can prevent them from becoming as celebrated as the steeds of Arabia, or Barbary. Indeed the Australian horse already equals them in power of endurance, although much must be done in the way of importation and careful selection before any near approach can be made in speed or beauty of form. And it fortunately happens that this region of Australia is conveniently situated for the importation of stud-horses of the Arab breed, which can

always be procured at the ports of India to which the colonist's own surplus stock is most likely to be consigned. The experiment of crossing with the Arab has already been well tested in the neighbourhood of Sydney with the very best results.

As the neighbouring islands, more especially Timor, Sumba or Sandalwood Island, Sumbawa, Lombok, and Bali abound in ponies, which can be purchased at rates varying from £ 1 to £ 3 sterling, the temptation to import mares from these islands for breeding purposes will be very great. Although personally averse to the introduction of inferior breeds, I am not prepared to say that the measure might not be attended with great pecuniary advantages; and if the precaution is taken of confining them to runs distinct from those frequented by the colonial stock, no great mischief could result from it. There can be no doubt that a cross between Island mares and horses of the Arab or even of the colonial breed would produce an animal better suited for private use among the inhabitants of the neighbouring European settlements as saddle and carriage horses than a larger description of stock, which again is best adapted for military purposes. A breeding stud on account of government was established in Java by the Governor General Van Der Capellen who succeeded Sir Stamford Raffles on the transfer of the island to the Dutch, the native mares, and others brought from Macassar, being crossed with Arab and Persian horses left behind by the English, and although Java is peculiarly unfitted for breeding horses from there being no naturally open country, the practice has been continued to the present day with success, but of course on a limited scale. M. Van Hogendorp, in his "*Coup d'Œil Sur L'isle de Java*" (1834) thus describes the results of the earlier experiment;—"The Governor General established with the same view a stud on account of Government in the neighbourhood of Tjanjor (about 70 miles inland from Batavia);—in the course of a few years the results were such as to afford a hope of undoubted success in the future; already in 1825 several horses bred in this stud could be placed at the disposition of the cavalry arm. As an establishment of this kind requires considerable time before it reaches the point at which the greatest advantages can be derived from it, it was not until after the departure of M. Van der Capellen (1825) that the stud of Tjanjor fulfilled the hopes that had been formed respecting it. At the time of my departure from Java, that is, at the end of 1827, there were sixteen stallions in the establishment, of which six were Arabs, six Persians, and one of the English breed from New Holland; 179 stud mares; and

213 colts and fillies under four years; those above that age had been drafted for the service of the cavalry or the government posts; the most distinguished, and those too light for these two services having been sold by auction on account of government. Seven young horses bred at the Tjanjor stud, only one of which was over four years, produced at public auction the sum of Florins 4,080, or almost Florins 580 each; this proves the superiority of their breed over that of the Java ponies, for which one pays ordinarily only from Florins 100 to 200; while the highest price paid for a very showy animal of superior size is never greater than Florins 250." (p. 212.)

The value of the Florin is twenty pence sterling, so that the average price of each of these young horses will have been upwards of £ 48. The value of the common Java pony has increased at least 50 per cent since M. Van Hogendorp wrote, but I cannot say whether the value of the improved breed has increased in the same ratio. When I was last at Batavia, in the year 1856, I saw many of them running in the carriages of the wealthier classes, but it struck me that they were very much inferior to the cross-bred horses I had seen there some years before. Our neighbours are, however, entitled to great credit for persevering under the unfavourable circumstances in which they are placed from the want of naturally open country for pasturage.

The best crossed bred animals that I have met with are those reared at the Glugor estate in Pinang, the dams being of the Sumatra breed and the stallions Arabs or Persians. The produce is an animal rather larger than a galloway, showy, but quiet to handle, and so much esteemed both for saddle and harness that I suspect this description of stock would meet with a more ready sale among the Island settlements at least, than full sized Australians. The Sumatra breed of ponies is smaller in size than those of Macassar or Sandalwood Island, and is certainly not superior in other respects, therefore the stock raised in Tropical Australia by crossing the Island breed will at least equal the Glugor stock, and is likely to be of much larger size. Under these circumstances a few details respecting the Island breeds of horses may not be uninteresting.

All the Island breeds seem to have come originally from Pegu or Burmah, and were most likely transported by sea, as there are no native horses in the Malay Peninsula. They first appear in Sumatra, where they are extensively bred by the Battas and other tribes of the interior, and are exported in considerable

numbers from Acheen, Dilli, Batu-bara and Assahan to the British Settlements in the Straits of Malacca. Java, and all the islands lying to the Eastward as far as Timor are also well stock-ed, and it is not a little remarkable that the breeds of Timor and Sumatra, at the two extremities of this line, bear the closest resemblance to each other, being smaller than the rest, but remarkable for spirit and endurance. This may be attributed to the striking resemblance in character of the uplands of Timor to those of the northern half of Sumatra, where horses are chiefly bred, the country in both cases consisting mostly of open limestone plains with only a few trees scattered here and there over the surface. Hitherto the export of horses from Timor which has extended to the Mauritius, Swan River, South Australia, and even Sydney, has been confined exclusively to males, partly because the natives wished to retain the females for reproduction, and partly because males were best suited for the purposes of the exporters; but the natives have no prejudices against the exportation of mares; they will only expect a higher price, perhaps double that of horses; but as the price of the latter at the frequented ports is only a musket or four dollars each, the cost will not be excessive. The horses of Roti and Saru do not differ much from those of Timor. At the latter island fine animals can occasionally be purchased that have been brought from Sandalwood Island, but they are always males, and a high price will be demanded.

The Sandalwood Island breed is the largest in size of any in the Archipelago, not even excepting that of Macassar. It is only recently that horses have been exported by ship loads from this island, and the trade is, I believe, confined to a single port on the north coast of the island, Palmedo Bay. In the event of colonists wishing to try the experiment on a large scale, this island would probably be the best source of supply for stud mares, as the European traders of Bali and Lombok would undertake to bring them in any numbers that might be required on very reasonable terms. I have not seen enough of the Sandalwood ponies to be in a position to give an unqualified opinion of them, but all the individuals that I have seen, amounting to between 30 and 40, were remarkable for size, and seemed to equal the Macassar ponies in spirit and endurance.

The Sumbawa pony is a beautiful, spirited, little animal, not unlike a miniature Arab. Individuals of the Timor and Sumatra breeds are occasionally met with which quite equal them in beauty, but they are exceptions, while in Sumbawa the rule

extends to the entire breed. These are called "Bimah" ponies in Java, from the chief port and settlement on the island, but they are not known by that name on the spot, the term "Bimah pony" being applied to a singular dwarf variety remarkably like the Shetland pony in every particular except shagginess of mane.

The horses of Bali and Lombok are inferior to those of Sumbawa and Macassar, but are superior to those of Java, the last indeed being reputed the most sluggish and underbred of all the races in the Archipelago. This, however, may be owing to the circumstances under which they chiefly known to Europeans, namely as carriage horses at Batavia, where the climate is to obnoxious to them after their life in the uplands, that they are constantly ill, and die off very soon. M. Van Hogendorp does not say much about them in his "*Coup d'Œil*" but his short notice may prove interesting. "The horses of Java are vigorous and mettlesome, but of small size. The inhabitants are fond of horse exercise, and highly appreciate the value of this noble animal; but in general the necessary means are wanting for improving the breed. The European colonists employ a great number of horses, a carriage being for them in this hot country as great a necessity as a pair of boots or shoes in Europe; Java cannot produce them in sufficient numbers, if supplies did not arrive regularly every year from Celebes, Timor, and Bimah. The horses of Bimah and Macassar have more fire than those of Java, and are also of a better breed." (p. 211.)

The superiority of the Macassar breed, both as regards size and bottom, is, indeed, undoubted, and is probably owing in a great measure to their extensive use among the natives of the interior both for hunting the deer which abound in the uplands, and also for warlike purposes. The deer are hunted by packs of horsemen instead of dogs, each horseman carrying a short lasso or noosed rope made of twisted rattan, the noose being kept spread by a slit made in the butt end of a light spear, and a catch or trigger of bamboo about 18 inches from the butt. The noose is passed over the head of the deer as soon as the huntsman overtakes him, and as they generally manage to surround the animal, it rarely escapes. The spear is provided with a sheath over the blade, which is removed and the lasso detached if a wild hog is started instead of a deer, which is said to occur rather frequently. The natives are bold and fearless riders, and their flying cavalry is still the terror of invaders; indeed it is this arm alone that has preserved to them that por-

tion of the country which still retains its independence.

I suspect that some difficulty would be experienced in obtaining brood mares from Celebes, as their exportation would probably be discountenanced by the Dutch authorities, who have no other source at present for remounts of their cavalry and artillery.

The Macassar broed has been introduced on the Southeast extremity of Borneo, where it is almost as abundant as in Celebes itself, and is also used by the natives for hunting deer. I have never yet heard, however, of any having been exported.

SHEEP.—Nothing short of actual experiment can decide the important question as to whether the Tropical region of Australia is suited for sheep-farming, but those who have closely watched the progress of the experiment which commenced some years ago with the occupation of Port Curtis cannot have any serious doubts as to the result. Of course the sheep farmer will have to keep up the staple of his fleeces to the standard level by frequent importation of improved rams, but he may not be put to greater trouble and expense in this behalf than he had incurred while depasturing his flocks in the south, where a hot wind of three days would do more injury to his flocks than weeks of mere sunshine, probably with a cool breeze during the whole time. The greatest nuisance that the sheep farmer will have to encounter, will, I think, be the grass seed, for if his flocks are allowed to run in the high grass when the seeds are ripe and the fleeces long, the latter are likely to suffer. This, however, can be obviated by precautions well known to sheep farmers, and the only disadvantage that I can foresee in connection with the tropical region will be the increased closeness of supervision required. This however is not likely to prove a disadvantage in the end.

It will not be necessary to enter into particulars respecting other kinds of domestic animals, as all those common in the Southern colonies appear to thrive equally well in the tropical region.

SECTION II.

THE CAMEL.

USED FOR EXPLORATION IN THE SOUTHERN COLONIES—SUITED FOR THE TROPICAL REGION—TWO VARIETIES—FLEECES—THE BOKHARA CAMEL—FINE CLOTH MADE FROM ITS WOOL.—WOOL-BEARING CAMEL OF TURKEY—MONGOLIAN BREED—ITS FLEECE—AFRICAN BREEDS—LARGE WHITE BREED—THE MAHARI OR SWIFT DROMEDARY—TRAINING AND EQUIPMENT—PACE AND STAMINA—FOOD—M. HUC'S ACCOUNT OF THE MONGOLIAN CAMEL—POWER OF ENDURANCE—BREEDING—TRAINING—FLEECE.

The camel has already been introduced in the southern colonies, some six or eight having been brought to Sydney from India in 1836,* and about thirty were imported at Melbourne a few years ago to serve as beasts of burthen in the exploring expedition towards the north then fitting out. Six of their number were taken by Mr. Burke, the leader of the expedition, on his journey with three companion from the depot at Coopers Creek to the Gulf of Carpentaria, but two only returned with the party to the depot, the others having either escaped, or been bogged and left in the creeks. No attempt appears to have been made as yet to increase their numbers by breeding, indeed in both cases they were

* I saw three of them in the Government domain at Sydney in 1838. They were in good condition, that did not seem very comfortable. I believe they were taken out every day to feed on the Sand Hills, where the Acacia abounds.

introduced for the especial purpose of exploration, although I am not aware that those brought to Sydney were ever so employed.

There can be no doubt whatever about the facility of introducing these animals, and increasing their numbers by breeding to any extent that may be desirable, so that the only point to be discussed is their prospective utility. Their introduction was advocated in the first instance on account of their peculiar adaptation for conveying explorers over a comparatively waterless country, such as the interior of Australia was then supposed to be, and which it was thought could not be examined without their aid. The colonists generally, however, were in favour of horses and cattle being employed for exploring purposes, as they could then follow up the footsteps of an explorer who had discovered tracts of good pastoral country with their flocks and herds, without incurring the risk of their perishing for want of water on the route, which might occur if they followed up the tracks of a camel party. Nor is the camel very popular among practiced colonists of the south as a beast of burthen, for although a full sized animal would carry a bale of wool slung on each side, yet the necessity for loading and unloading at the beginning and end of every stage, and the difficulty of keeping the bales dry, render this mode of conveyance highly objectionable where hand labour is scarce. So far with regard to the Southern colonies, but in the tropical region circumstances are likely to render the introduction of the camel almost a necessity. Groupes of sheep stations will come to be formed around the small fresh-water lakes and permanent water holes lately discovered in the country north of Adelaide, and a protracted drought may cut off communication by bullock dray with the high road that will soon be made across the continent from Adelaide to the Victoria River, perhaps at a time when the settler has his wool ready for the market, and wishes to obtain his annual supplies. In such cases the aid of an animal like the camel will be almost a necessity, and it only remains to be considered how it may be introduced and successfully propagated.

There are only two distinct varieties of the camel, namely the Bactrian or camel proper, with two humps, and the dromedary, with a single hump, both of which are in general use throughout Southern Asia and North Africa as beasts of burthen; but the camel is considered to be the more docile, and the dromedary the swiftest and most enduring. Both varieties can be obtained with ease at all the ports in India which present markets for horse stock, and young females for breeding can be

purchased in the neighbourhood of Madras at rates of from £ 10 to £ 15 per head, the Madras coast being also the locality in which an useful class of camel-drivers can be most readily engaged. But the antecedents of colonists in Australia are likely to direct their attention towards the development and improvement of the fleeces of these animals, which may possibly be attended with results equally favourable to those which have crowned their labours when sheep were the object of experiment ;—for certainly the fleece even of the camel of India, is very little if at all inferior to that of the Cape breed of sheep, of which the flocks of New South Wales were almost exclusively composed when the Merino ram was first introduced. And it fortunately happens that in the case of the camel it will not be necessary to send so far as Europe for males of the improved breeds, as the Bokhara camel, which is supposed to yield the finest fleece of all the Tartar breeds, can be obtained at the British port of Kurachee, near the mouth of the Indus, if the precaution has been taken of ordering it during the preceding season. The cloth made from the fleece of this camel is very much esteemed throughout Persia, Turkey and the north of India. Mr. Ferrier, in his “Caravan Journeys” published in 1857, gives the following account of its manufacture, which he found carried on by the Hasarahs, a tribe occupying the country east of Kabool :—“Since then the Sirdar has contented himself with the large profits arising from his stud, his numerous flocks, and the manufacture of a cloth called *kourk* or *barek*, woven of an exceedingly fine and silky wool which grows on the belly of the camel ; nothing can be softer or warmer than these *bareks*. but unluckily they are badly woven—if they were better made, they would be preferable to every other kind of cloth. As the nomads never dye the raw material, the *barek* is of the same colour as the camel ; the price varies from ten shillings to four pounds a piece, and one is sufficient to make an Afghan robe. The Afghan and Persian nobles, even the sovereign, always wear it in winter. The wool, a kind of down on the other parts of the animal, is used for *kourks* of an inferior quality ; this down is preserved from the effects of the weather by the wool that covers it, which is used for *kourks* of the coarsest description ; a down similar to that which grows on the camel, but infinitely superior in quality, grows under the hair of the goat, and cloth of incomparable beauty and quality is made of it.” (p. 192.)

There is a variety of the camel in Turkey, in the neighbourhood of the Black Sea, which yields a very fine, long, silky

fleece. The importation of the animal however, would be attended with considerable expense as it would have to be brought overland to the shores of the Red Sea for shipment to its destination.

The Mongolian camel is also deserving of attention, as it abounds in the neighbourhood of Pekin, and could be obtained without great difficulty at Shanghae or any of the ports of northern China. And as Shanghae is likely to prove a market for Australian horses, the camels may be brought down as a return cargo. M. Huc, the celebrated French Missionary traveller, gives a very full account of this animal in his "Travels in Tartary, Thibet, and China", which will be inserted as a note at the end of this Section. The fleece is described as weighing about ten pounds, and as being "sometimes finer than silk and always longer than sheep's wool";—and the animal seems to moult and cast off its fleece in a mass when summer comes. I suspect that both this and the Bokhara animal will prove to be dromedaries, as having only a single hump.

The African representatives of the camel and dromedary of Asia seem to be clothed with hair instead of wool, like the Cape sheep; at least I have never heard of their fleeces being made into cloth, unless the hair matting used for tent covers can be so called. They are nevertheless deserving of attention, their strength and power of endurance appearing to be very great. But upon the latter point, travellers have to depend generally on the statements of the natives, as they rarely have opportunities of putting these powers to the test in their own persons. The white camel of the Sabara must be a noble beast. The Rev. H. B. Tristram in his lately published work on "the Great Sahara" thus describes some specimens that he met with at Beni Isguen, about 300 miles south of Algiers: "Among the camels we noticed many white ones of enormous size, from Touat and Timbuctoo—one in particular, a colossal beast, towered even above his tall fellows. He was the largest camel I ever saw, and bore the same relation to the others that a London dray does to an ordinary plough horse. These great camels must not on any account be confounded with the more celebrated Touareg "mahara," or swift white dromedaries. They are as distinct from them as a cart-horse is from a thoroughbred racer, and are capable of bearing more than double an ordinary camel's burthen. They can travel for fourteen days without water, and, as far as we could learn, are only bred in the neighbourhood of Touat, in the very centre of the desert. Being most intolerant of cold, they are never taken to the M'Zab or Wareglan country, but there their burdens are transferred to the smaller animals of the Tell." (p. 165.)

This author's account of the Mahari, or swift dromedary, is equally interesting :—

"But the most peculiar appendage of the Touareg is his magnificent "mahari" or white dromedary, as indissolubly associated with these people as the horse is with the sons of Ishmael. This graceful creature, which may generally be seen kneeling in the souk of any M'Zab city, with its fawn-coloured head and neck towering above the camels round, bears the same relation to them that the thorough bred racer does to the cart-horse. Its small head, its very fine coat, its great length of limb and depth of chest, all bespeak the highest "breeding." I never saw any ordinary camel (or djimel) which approached within 18 inches the stature of a mahari ; but the most distinct development is in the depth and width of the chest, while the hump is comparatively small."

"The Saharans maintain the mahari to be a distinct species, but it is not necessary to be an acceptor of Mr. Darwin's theory in order to believe that this noble creature is simply the development of the camel by a long course of artificial selection in a dry hot climate, where speed, and not the power of bearing burdens, was the one object aimed at. The Touareg is as careful in the selection of his breeding mahari as the Arab is in that of his horse. All intermixture with the common camel is carefully avoided, and as the pedigrees are handed down, many a dromedary can boast a genealogy far longer than the descendants of the Darley Arabian."

"The training of these white dromedaries, as the French term them, is among the noble mysteries of the desert ; and certainly the mahari, so far as my own observation goes, is rendered obedient to the word of command, and lies down, turns, rises, quickens or slackens its pace, as no other camel is taught, at the voice of its rider. It is also guided by a bridle—a single thong of leather attached to a ring inserted in its nostrils when very young, and by which its rider directs it—dexterously flinging the rein over its head, and drawing it to either side at pleasure, a mode of guidance never adopted with the ordinary camel."

"But the most singular part of the dromedary's equipment is the saddle, placed not on the hump, but on the neck or shoulders. It is prevented from slipping from its position by two girths ; one just behind the forelegs, and the other round the neck. The saddle itself is in shape like a chair, a wooden frame with a high back, covered with leather, and a curious high peak in front, narrow at the base, round which the rider crosses his

legs, with a wide and flat top on which he can lean his body, and round which his pouches are slung. To an inexperienced rider no motion can be more trying than that of the dromedary saddle. The only relief to be obtained from the uneven movement of the creature's shoulders, as it trots, is by resting the body against the peak, and unless it be lifted at each step a violent blow on the chest or stomach is the inevitable consequence."

"The ordinary pace of the animal is a swinging trot, and this it will keep up from sunrise to sunset without intermission, accomplishing with ease 80 miles a day. Fabulous tales are recounted of dromedaries which have run 250 miles without a halt, and repeated the same distance the following day, but the endurance of even a Touareg could scarcely have sat out such a stage. To protect themselves from the exhaustion of the motion, the Touareg, before mounting, tie a very thick and tight bandage of leather round the stomach and loins. The mahari is fed principally upon dates instead of barley, which can readily be procured in the desert, and with a small supply of this fruit added to the dry coarse herbage of the country, will undergo the severest fatigues." (p. 239.)

The author speaks elsewhere (p. 154) of the working camels being fed upon *date-stones* which have been pounded and broken in a stone mortar. As the stone of the date is as hard as box-wood, M. Huc's statement that dry wood itself supplies the Mongolian camel with efficient food scarcely appears an exaggeration. Tropical Australia would be a perfect paradise in their sight, nearly half the shrubs consisting of the *Acacia* on which they love to browse, while from the great height of the animal the seed of the native grasses, even when the stems are six feet high, would be easily collected and stripped off by their long, flexible tongues.

[An Account of the Mongolian Camel, its Habits, Power of Endurance, Breeding, Training, and Fleece, extracted from M. Huc's "Travels in Tartary Thibet, and China."]

"This great salt mine (the Dabsoun Noor, in the latitude of Peking) seems to pervade with its influence the Ortous district, throughout whose extent the water is brackish, the soil arid, and the surface encrusted with saline matter. This absence of rich pasturage and fresh water is very adverse to the growth of cattle; but the camel, whose robust and hardy temperament adapts itself to the most sterile regions, affords compensation to the Tartars of the Ortous. This animal, a perfect treasure to the dwellers in the desert, can remain a fortnight, or even a month, without eating or drinking. However wretched the land may be on which it is put to feed, it can always find wherewith to

satisfy its hunger, especially if the soil be impregnated with salt or nitre. Things that no other animal will touch, to it are welcome; briars and thorns, dry wood itself, supply it with efficient food."

"Though it costs so little to keep, the camel is of an utility inconceivable to those who are not acquainted with the countries in which Providence has placed it. Its ordinary load is from 700 to 800 lbs., and it can carry this load ten leagues a day. Those, indeed, which are employed to carry dispatches, are expected to travel eighty leagues per diem, but then they only carry the dispatch bearer. In several countries of Tartary the carriages of the kings and princes are drawn by camels, and sometimes they are harnessed to palanquins: but this can only be done in the level country. The fleshy nature of their feet does not permit them to climb mountains, when they have a carriage or litter of any sort to draw after them."

"The training of the young camel is a business requiring great care and attention. For the first week of its life it can neither stand nor suck without some helping hand. Its long neck is then of such excessive flexibility and fragility, that it runs the risk of dislocating it, unless some one is at hand to sustain the head while it sucks the teats of its dam."

"The camel, born to servitude, seems impressed from its birth, with a sense of the yoke it is destined to bear through life. You never see the young camel playing and frolicking about, as you see kids, colts, and other young animals. It is always grave, melancholy, and slow in its movements, which it never hastens, unless under compulsion. In the night, and often in the day also, it sends forth a mournful cry, like that of an infant in pain. It seems to feel that joy or recreation are not within its portion; that its inevitable career is forced labour and long fastings, until death shall relieve it."

"The maturation of the camel is a long affair. It cannot carry even a single rider until its third year; and it is not in full vigour until it is eight years old. Its trainers then begin to try it with loads, gradually heavier and heavier. If it can rise with its burden, this is a proof that it can carry it throughout the journey. When that journey is only of brief duration, they sometimes load the animal in excess, and then they aid it to rise by means of bars and levers. The camel's capacity for labour endures for a long time. Provided that at certain periods of the year it is allowed a short holiday for pasturing at its leisure, it will continue its service for full fifty years."

"Nature has provided the camel with no means of defence against other animals, unless you may so consider its piercing, prolonged cry, and its huge, shapeless, ugly frame, which resembles, at a distance, a heap of ruins. It seldom kicks, and when it does, it almost as seldom inflicts any injury. Its soft, fleshy foot cannot wound, or even bruise you; neither can the camel bite an antagonist. In fact, its only practical means of defence against man or beast is a sort of vehement sneeze, wherewith it discharges, from nose and mouth, a mass of filth against the object which it seeks to intimidate or annoy."

"Yet the entire male camels, *bore* as the Tartars call them, (*temen* being the generic appellation of the animal), are very formidable during the twelfth moon, which is their rutting time. At this period, their eyes are inflamed; an oily, fetid humour exhales from their heads; their mouths are constantly foaming; and they eat and drink absolutely nothing whatever. In this state of excitement they rush at whatever presents itself, man or beast, with a fierceness of precipitation which it is impossible to avoid or to resist; and when they have overthrown the object they have pursued, they pound it beneath the weight of their bodies. The epoch passed, the camel resumes its ordinary gentleness, and the routine of its laborious career."

"The females do not produce young until their sixth or seventh year; the period of gestation is fourteen months. The Tartars geld most of their male camels, which, by this operation, acquire a greater development of strength, height, and size. Their voices become at the same time thinner and lower, in some instances wholly lost; and the hair is shorter and finer than that of the entire camels."

"The awkward aspect of the camel, the excessive stench of its breath, its heavy, ungraceful movements, its projecting hare-lips, the callosities which disfigure various parts of its body, all contribute to render its appearance repulsive; yet its extreme gentleness and docility, and the services it renders to man, render it of preeminent utility, and make us forget its deformity."

"Notwithstanding the apparent softness of its feet, the camel can walk upon the most rugged ground, upon sharp flints, or thorns, or roots of trees, without wounding itself. Yet, if too long a journey is continuously imposed upon it, if after a certain march you do not give it a few day's rest, the outer skin wears off, the flesh is bared, and the blood flows. Under such distressing circumstances, the Tartars make sheep-skin shoes for it, but this assistance is unavailing without rest; for if you attempt to compel the camel to proceed, it lies down, and you are compelled either to remain with or to abandon it."

"There is nothing which the camel so dreads as wet, marshy ground. The instant it places its feet upon anything like mud, it slips and slides, and generally after staggering about like a drunken man, falls heavily on its sides."

"When about to repose, it kneels down, folds its fore legs symmetrically under its body, and stretches out its long neck before it on the ground. In this position, it looks just like a monstrous snail."

"Every year, towards the close of spring, the camel sheds its hair, every individual bristle of which disappears before a single sprout of the new stock comes up. For twenty days the animal remains completely bare, as though it had been closely shaved all over, from the top of the head to the extremity of the tail. At this juncture, it is excessively sensitive to cold or wet; and you see it, at the slightest chilliness in the air or the least drop of rain, shivering and shaking in every limb, like a man without clothes exposed on the snow. By degrees the new hair shows itself, in the form of fine, soft, curling wool, which gradually becomes a long, thick fur, capable of resisting

the extremest inclemency of the weather. The greatest delight of the animal is to walk in the teeth of the north wind, or to stand motionless on the summit of a hill, beaten by the storm and inhaling the icy wind. Some naturalists say that the camel cannot exist in cold countries; these writers must have wholly forgotten the Tartarian camels, which, on the contrary, cannot endure the least heat, and which certainly could not exist in Arabia.

"The hair of an ordinary camel weighs about ten pounds. It is sometimes finer than silk, and always longer than sheep's wool. The hair growing below the neck and on the legs of the entire camels is rough, bushy, and in colour black, whereas that of the ordinary camel is red, grey, and white. The Tartars make no sort of use of it. In the places where the animals pasture, you see great sheets of it, looking like dirty rags, driven about by the wind, until they are collected in sheltered corners, in the hill sides. The utmost use the Tartars make of it is to twist some of it into cord, or into a sort of canvass, of which they construct sacks and carpets."

"The milk of the camel is excellent, and supplies large quantities of butter and cheese. The flesh is hard, unsavoury, and little esteemed by the Tartars. They use the hump, however, which, cut in slices, and dissolved in tea, serves the purpose of butter. It is known that Heliogabalus had camel's flesh served up at his banquets, and that he was very fond of camel's feet. We cannot speak as to the latter dish, which the Roman Emperor piqued himself upon having invented, but we can distinctly affirm that camel's flesh is detestable."—(*Travels &c. vol. I. pp. 206 et seq.*)

SECTION III.

GRAIN, FRUIT, AND GARDEN VEGETABLES.

WHEAT—MAIZE—THE BANANA—THE PINE APPLE—WATER MELON—CUSTARD
APPLE—GUAVA AND JAMBO—ORANGE, LIME, PEACH, APRICOT AND GRAPE—
GARDEN VEGETABLES—THE PUMPKIN, TURNIP RADISH, TOMATA, CAPSI-
CUM, SWEET POTATO, ONION, AND THE EUROPEAN POTATO.

[NOTE.—The Northeast Coast from the Tropic as far north as Cape Tribulation is not included in the localities referred to in this section. As stated elsewhere, I think it highly probable that all the fruits and vegetables grown in the neighbourhood of Sydney will succeed on this part of the coast if planted at a small elevation above the level of the sea.]

WHEAT.—This grain did not succeed at Port Essington, for although it could be made to produce an ear, the seeds never came to maturity, nor do I think that it is ever likely to be grown near the sea except at a certain elevation above its level. Wheat of very good quality, but rather small in the grain, is, however, produced in considerable quantities in the Portuguese settlements on the north side of Timor, at an elevation of 1200 feet above the sea level, and as this locality is three degrees of latitude nearer the Equator than Port Essington, there can be no reasonable doubt as to its succeeding equally well on the uplands of the Tropical Region at a much smaller elevation;—so that the stock stations of the interior will be able to grow their own supplies if the trans-

port of flour from the sea-coast proves too expensive. The Portuguese in Timor obtained their seed originally from Demaun, in the neighbourhood of Bombay. Australian seed will produce a larger grain, but nothing can exceed in quality the flour yielded by the Timor wheat. The crop is reaped within five months after the sowing of the seed.

MAIZE grows well both near the sea and on the uplands, and produces so abundantly that it is likely to prevent attention being paid to other descriptions of grain as food for stock. Some cobs of the first crop raised at Port Essington excited the admiration of the natives of Timor and the Islands, who were thankful to obtain a few grains as seed. The cobs were, indeed, four times the size of those grown on the Islands, and produced at least three times the number of seeds. Maize (not rice) is the staff of life among the natives of these hilly groups, for although the sago palm exists, it is not so plentiful as at Ceram and the Moluccas.

Wheat and Maize being alone sufficient to supply the wants of an European people engaged in pastoral pursuits, other cereals are not likely to be cultivated until the country becomes populous. Rice could be grown to perfection on the low lands near the coast and on the banks of rivers, but a large amount of manual labour is required for its cultivation.

THE BANANA is likely to become the most popular of all fruits among colonists in Tropical Australia, as it produces a full crop within a few months after being planted, and the fruit itself is less palling to the appetite than any other tropical fruit. It succeeds best on newly cleared land, and requires very little care beyond the erection of a stout fence around the spot where it is planted to keep off sheep and cattle, who would otherwise soon devour their juicy stems and leaves. The plant dies after yielding a single crop, but it is reproduced by the suckers which shoot up from around the root, all of which with the exception of a single plant should be removed, and transplanted elsewhere. Young plants can be obtained at all the neighbouring islands. At Port Essington the original stock was brought from Kissa, one of the Serwatty Islands, and consisted of about 20 suckers, the stems and leaves of which were cut off about a foot above the root, when they were put into bags without earth, and hung up under the beams in the hold of the vessel. Although the voyage occupied a fortnight, not a single plant died, and in the course of three years, every garden in the settlement was fully stocked.

THE PINE APPLE also proved a great success at Port Essington. The plant is easily introduced from the islands, as the crown of the fruit takes root if twisted off and set a few inches deep in a shallow box of mould. When once planted in a favourable spot it propagates itself by sprouts from the root like the banana, and spreads rapidly without any care whatever, as the prickles on the leaves keep off every animal except the wild hog, which does not exist in Australia. It seems to thrive best on rocky points near the sea; where there is barely sufficient soil to cover the roots;—but it succeeds well everywhere, even on the *permatangs* or sand-ridges thrown up by the sea, where, however, there is a large amount of calcareous and decomposed vegetable matter.

THE PAPAYA, (*Carica Papaya*) the Papaw of India, is found throughout the islands, and also grew well at Port Essington. It is propagated from the seed, which is round and black, and is sometimes used instead of capers as sauce for boiled mutton by economical house-keepers. The plant sends up a stout but rather soft stem, eight or ten feet high, which is crowned by a thick cluster of leaves. The fruit, which is of the size of a small melon, and not unlike that fruit both without and within, grows from the stem below the cluster of leaves. The fruit, eaten as a melon, is much liked by some, but it is far more generally esteemed when used as a tart fruit, or in lieu of apples in the composition of sauce. The leaves have also some useful properties, for if freshly killed meat is wrapped up in the young leaves, and a handful is also thrown into the pot in which it is being boiled, it can be served at table the same day as tender as meat that has been hung up for weeks in a cool climate. This plant seems to have been first introduced from America, but it has now become so common in the Archipelago that it is to be seen around nearly every house, European or native, and has even penetrated among the Papuans of New Guinea and Torres Strait, who have been for ages almost cut off from intercourse with strangers.

THE WATER MELON. This fruit also was introduced and fully succeeded at Port Essington, and although not equal in size or flavour to some of which I have partaken in Western Australia, it is immeasurably superior to those of the islands.

THE CUSTARD APPLE, (*Anona squamosa*,) Buah Nona of the Malays, produced well at Port Essington, but requires care, as I believe is the case everywhere. Its congener the Soursop (*A. muricata*) was also introduced and the fruit proved greatly superior to that grown on the Islands.

THE GUAVA and the Jambo, which belong to the same natural order as the Eucalyptus, seemed to thrive at Port Essington, but they were not much esteemed. Owing to some perversity of taste, I suppose, the little Native Gooseberry was preferred to all other fruits, at least in the concoction of tarts and puddings. A description of this fruit, which would amply repay any care that might be bestowed on its cultivation and improvement, will be found in Section I. of Part II.

THE ORANGE, LIME, PEACH, APRICOT, and GRAPE are already well known in the southern colonies. The two first did well at Port Essington, and I think the others would succeed on the table lands of the interior, especially where the limestone formation prevails, but experience alone can decide this point.

GARDEN VEGETABLES.

THE PUMPKIN will be a very popular vegetable at the inland stations, as it is readily propagated from seed, and grows well around or over the huts; while the fruit is not only esteemed when boiled as a vegetable, but as an ingredient of pies and puddings. It grew to admiration at Port Essington, and several of the more careful and industrious of the marines forming the garrison were able to collect sufficient money, by disposing of their surplus to the shipping, to purchase their discharge from the service on their arrival at Sydney, after the breaking up of the establishment.

THE TURNIP RADISH has a white root, longer and more tapering than that of the turnip, and partakes of the character of both the vegetables after which it is named, as its roots, when well boiled, are not a bad substitute for the turnip, while the top affords excellent greens, and the young roots eaten raw are quite equal to the European radish. It is a Chinese vegetable, and is cultivated at Copang in Timor for the use of the inhabitants and shipping, from which place seed can be easily procured. Neither the turnip nor the European radish grows well near the coast. Probably the latter may succeed on the uplands.

THE TOMATO, or Love apple (*Lycopersicon esculentum*) proved a great success at Port Essington, producing fruit at all seasons of the year. The seed was brought with us from South America. It is likely to grow well in all parts of the tropical region.

THE CAPSICUM. Several varieties of this plant were grown at Port Essington, chiefly the large and less pungent kind and the small bird's-eye pepper. Both produced abundantly. It is

evidently well suited to the soil and climate of the tropical region.

The SWEET POTATO (*Convolvulus batatas*) produced exceedingly well, and proved a good substitute for the European potato, which would not grow near the coast.

The YAM, the MANIOC or Cassava root from which Tapioca is made, and the ARROW ROOT (*Maranta arundinacea*) also succeeded, but were not cultivated for use, as Yams of excellent quality were obtainable at a very cheap rate from the neighbouring islands, and the others are not esteemed as food.

The ONION. Several varieties were tried, but every attempt proved a failure. Imported bulbs sprouted when set in the ground, but they never produced seed, nor would imported seed grow when planted. As in the case of wheat and the European potato, I think the failure is attributable to local circumstances probably the low level of the land on which alone experiments have been made; as onions as well as wheat are grown on the uplands of Timor, three degrees nearer the Equator, in such quantities as to form important articles of export; while the European potatoe grows spontaneously on the south slope of Bonthain Hill, a mountain in Celebes, only six degrees south of the Line. The Bonthain potatoes were introduced by Europeans, I believe during the period of British occupation, and have now overspread a considerable portion of the slope. The roots are collected by the natives, and exported in small quantities to Macassar. Although not much larger than grapes, they are exceedingly well flavoured, and are not unlike early English potatoes.

SECTION IV.

THE COCONUT PALM.

CULTIVATED ON A LARGE SCALE—THE COCONUT IN AUSTRALIA—MODE OF
MANUFACTURING OIL IN PROVINCE WELLESLEY—COST AND PROFITS OF
THE CULTIVATION—THE ELEPHANT BEETLE—GATHERING THE NUTS—
AMOUNT OF PRODUCE—COCONUT OIL.

This valuable palm is so well known and appreciated that it will be unnecessary to enter into details respecting the many useful purposes to which the nut, and even the tree itself is applied. It is only of late years that attention has been turned by Europeans to the cultivation of the Palm on a large scale with a view to the exportation of the produce, and the result has created an impression that it affords more steady and certain profits than any other kind of tropical cultivation in which Europeans have ever engaged. And I cannot produce a fairer example than is presented by the past and present state of the culture of the coconut in Province Wellesley, where the plantations are of such extent that journeys of miles may be performed without passing from under their shade. In the year 1836, when Colonel Low, my predecessor in civil charge of the Province, published his "Dissertation on the Soil and Agriculture of Penang and Province Wellesley," there were only 20,000 coconut trees in the Province. Now, in 1862, a single proprietor, Mr. Forbes Brown, has a plantation containing between

60,000 or 70,000 trees, about a third of which are in bearing. As Colonel Low had great practical experience in the culture, having laid out extensive plantations in the Province, his remarks on the subject, which I extract at the end of this Section, are peculiarly valuable.

The coconut succeeded admirably at Port Essington, the trees arriving at maturity without a check, and then producing an abundance of well-filled nuts, while they were never molested by beetles or other insects. The tree grows best along the coast, at a distance of not more than a mile from the sea, and seems to thrive equally well on the inner margins of mangrove swamps, and along sandy beaches immediately above the level of high water mark. As there are upwards of three thousand miles of coast line from Cape York to the Northwest Cape, more than nine-tenths of which are adapted to the growth of the coconut, it may be anticipated that the culture of the nut, and its manufacture into oil, will some time or other become an important branch of industry. Seed can be obtained from any of the neighbouring islands, but the best nuts for planting are those of Timor, Lombok, and Macassar.

The manufacture of oil from the nut is not a very difficult process. In Province Wellesley the manufacture is carried on by Chinese, who contract with the planters for a supply of nuts, and if the plantation is a large one, they generally obtain permission to erect their establishment in some convenient spot within its limits. This consists of a large shed or bangsal, closed at the sides, near the centre of which are the boilers, shallow iron pans three or four feet in diameter, set in a frame of brick work, the sides of the pans being raised about two feet by upright wooden staves like those of a cask, kept together with hoops of bamboo. The nut is first stripped of its husk or coir, which is used as fuel (the Chinese not having yet learned to prepare the fibre) and the nut is then split into two halves by two or three well directed blows with the back of a bill hook. The kernel is easily scooped clean out of the divided shell, and is reduced to a pulp by rubbing it on a narrow board studded with short bits of brass wire driven in until only an eighth of an inch remains above the surface, the board itself being fixed across the mouth of a tub into which the pulp falls. The pulp is then removed to one of the pans, and a slow fire is kept up below it for about 12 hours, the heating process generally commencing in the evening and continuing until next morning, when the pulp is removed in small quantities to

a large basket standing over a tub. The pulp is then sprinkled with water, when one of the workmen gets into the basket and tramples on the pulp, the sprinkling being continued until no more oily matter can be extracted, when the refuse is thrown out to the pigs, which always form part of the establishment. As each tub becomes filled, its contents are allowed to stand for some hours to allow every particle of oil to float to the surface, after which the oil and a thick scum that has formed over it are carefully skimmed off and put into a clean pan, under which a moderate heat is kept up to evaporate any particles of water that may be mixed with the oil, while the scum is removed by a wire strainer with a wooden handle, in shape and size like a battle-dore, which is raked through the oil until the scum has disappeared, when the oil, now as clear as spring water, may be taken to market as soon as it has become cool.

It is surprising that European skill has not yet devised a process by which perfect extraction of the oil, and pureness of colour, may be combined with great saving of labour.

Colonel Low's account of the cultivation of the coconut tree referred to above is as follows:—

"The cultivation of this Tree deserves particular notice, since its fruit, not only forms part of the daily food of all classes of the community, but is an exportable article to neighbouring regions, and as of late years, the oil, which it yields, has been rendered available in the manufacture of candles in England."

"On a rough estimate,—for an actual enumeration has not been lately taken—the total number of *bearing trees* on Penang may be stated at 50,000, and those in Province Wellesley at 20,000; but very large accessions to these numbers, have of late years, been made. The tree is partial to a sandy soil in the vicinity of the sea, and Province Wellesley offers, therefore, greater facilities, perhaps, for its cultivation than Penang does, as its line of clear beach is longer, and has many narrow strips of light or sandy land lying betwixt the alluvial flats inland. There are several kinds of this tree known here; one has a yellowish colour, observable both on the branches and unripe fruit; its branches do not droop much: a second has green, spreading, branches more drooping than the former, the fruit being green coloured until ripe, and this is perhaps the most prolific; it also bears the soonest, if we except the dwarf coconut, which fruits at the second or third year, before the stem has got above one foot high."

"This last kind was brought from Malacca; it attains in time to the height of the common sort. Its fruit is small and round and of course less valuable than the other sorts; there is also a coconut so saturated with green, that the oil, expressed from its kernel, partakes of that colour."

"It is a mistaken supposition that the coconut tree will flourish

without care being taken of it. The idea has been induced by the luxuriant state of trees in close proximity to houses and villages, and in small coves where its roots are washed by the sea. In such circumstances, a tree from being kept clear about the roots, from being shaded, and from occasional stimuli, advances rapidly to perfection; but in an extended plantation, a regular and not inexpensive system of culture must be followed to ensure success."

"The nuts being selected, when perfectly ripe from middle-aged trees of the best sorts, are to be laid on the ground under shades, and after the roots and middle shoot, with two branches, have appeared, the sooner they are planted the better. Out of 100 nuts only two-thirds, on an average, will be found to vegetate. The plants are then to be set out at intervals of 30 or 40 feet,—the latter, if ground can be spared,—and the depth will be regulated by the nature of the soil, and the nut must not be covered with earth. The plants require, in exposed situations, to be shaded for one or even two years, and no lalang grass must be permitted, to encroach on their roots. A nursery must be always held in readiness to supply the numerous vacancies which will occur from deaths and accidents. The following may be considered the average cost of a plantation, until it comes into bearing":—

FIRST COST;

100 ORLONGS OF LAND.*

Purchase money of land, ready for planting	1,000
7,000 Nuts @ 1½ dr. ₱ 100	105
Houses of collies, carts, buffaloes, &c. &c.	100

Sp. Drs. 1,205

YEARLY COST FOR 7 YEARS;

1st year, 10 labourers @ 3 drs. ₱ month, including carts, &c. ..	360
Tear and wear of buildings, carts and implements	50
Overseer @ 7 drs. ₱ month	84
Quit-rent, average	50
Nursery and Contingencies	50

Total, ₱ annum ... 594

Seven years at this rate will be 4,158

Total, Spanish dollars.. .. 4,725

"To this sum, interest will have to be added, making perhaps a sum total of Spanish dollars 6,600, and this estimate will make each tree, up to its coming into bearing, cost one Spanish dollar at the

* The orlong is about an acre and a third.

lowest. The young cocoanut tree requires manure, such as putrid fish and stimulating compounds, containing a portion of salt. On the Coromandel Coast the natives put a handful of salt below each nut on planting it."

"The chief natural enemy of this tree is a species of elephant-beetle, which begins by nibbling the leaves into the shape of a fan; it then perforates the central pithy fibre, so that the leaf snaps off, and lastly, it descends into the folds of the upper shoot, where it bores itself a nest, and if not speedily extracted, or killed, will soon destroy the tree. It has been found impossible to cultivate the coconut tree at Singapore, on account of the depredations of this creature."

"In Penang and Province Wellesley, it has only been observed, within the last two years, and is believed to have come from Keddah. A similar kind of beetle is, however, known on the Coromandel Coast, and it is extracted by means of a long iron needle or probe, having a barb like that of a fish hook. By using this and by pouring salt or brine on the top of the tree, so as to descend amongst the folds of the upper shoot, the evil may be prevented or got rid of. The natives of Keddah say that this insect appears at intervals of two, three or more years. The cultivators here adopt a very slovenly expedient for collecting the fruit. Instead of climbing the tree in the manner practised on the Coromandel Coast, by help of a hoop passing round the tree and the body of the climber, and a ligature so connecting the feet as to enable him to clasp the tree with them, the Malays cut deep notches, or steps, in the trunk in a zig-zag manner, sufficient to support the toes or the side of the foot, and thus ascend with the extra aid only of their arms. This mode is also a dangerous one, as a false step, when near the top of a high tree, generally precipitates the climber to the ground. This notching cannot prove otherwise than injurious to the tree. But the besetting sin of the planter of coconuts, and other productive trees, is that of crowding. Coconut trees, whose roots occupy, when full-grown, circles of 40 to 50 feet in diameter, may often be found planted within eight or ten feet of each other, and in the native campongs all sorts of indigenous fruit trees are jumbled together, with so little space to spread in, that they mostly assume the aspect of forest trees and yield but sparing crops."

"The common kinds of the coconut, under very favorable circumstances, begin to bear at six years of age; but little produce can be expected until the middle or end of the 7th year. The yearly produce, one tree with another, may be averaged at 80 nuts the tree; where the plantation is a *flourishing* one,—assuming the number of trees, in one hundred orlongs, to be 5,000—the annual produce will be four hundred thousand nuts, the minimum local market value of which will be four thousand Spanish dollars, and the maximum 8,000 dollars. From either of these sums six per cent. must be deducted for the cost of collecting and carriage, &c. The quantity of oil which can be manufactured from the above number of nuts will be, as nearly as possible, 834 China piculs of 133½ lbs."

"The average price of this quantity at 7 drs. per picul*... .. 5,838
 Deduct cost of manufacturing, averaged at one-fourth, and col-
 lecting, watching, &c."... .. 2,059

Profit Spanish dollars... .. 3,779

"The Chinese, who are the principal manufacturers of the oil, readily give a picul of it in exchange for 710 ripe nuts, being about 563 piculs of oil out of the total produce of the plantation of 100 orlongs. The price of cocoanut oil has been so high in the London market as from £30 to £35 per ton, or about an average of ten dollars per picul. But it rose last year to 15 dollars per picul in Penang, and is now at 9 drs. It is said, that English casks have not been found tight enough for the conveyance of this oil to Europe, but if the article is really in great demand, a method will, no doubt, be discovered to obviate this inconvenience."

"So long, however, as the cultivator can obtain a dollar and a half, or even one dollar for 100 nuts, he will not find it profitable to make oil, unless its price rises greatly."

"Soap is manufactured at Pondicherry from this oil, but it is not seemingly in repute; the attempt has not been made in Penang with a view to a market."

"There is scarcely any coir rope manufactured at this island, so that the profit which might (were labour cheaper) rise from this application of the cocoanut fibre, is lost. The shell makes good charcoal; the leaves are scarcely put to any purpose, the nipah being a superior, material for thatching."

"The cocoanut tree is exceedingly apt to be struck by lightning, and in such cases, it is generally destroyed. It is a dangerous tree, therefore, to have close to a house."

"If the trees are widely planted, Coffee may be cultivated under their shade. It is generally believed that the extracting of toddy from this tree hastens its decline."

"The Nicobar and Lancavi Islands used partly to supply the Penang market with this indispensable article; but their depopulation has greatly reduced the quantity."

"On the whole it may be said, that there is no cultivation which insures the return of produce with so much certainty as that of the cocoanut tree; and as Rangoon, the Tenasserim Coast, and Singapore will, probably, always remain good markets for the raw nut, there appears to be every chance of the value of that produce, affording ample remuneration to the planter."—(*Dissertation &c.*, p. 43 et seq.)

* The picul is 133½ lbs. Avoirdupois.

SECTION V.

THE DATE PALM.

THE ARABIAN DATE—METHOD OF CULTIVATION—THE FRUIT—PALM WINE—
THE CABBAGE OR HEART—THE DATE-PALM OF BENGAL—PRIZE ESSAY ON
ITS CULTIVATION, AND THE MANUFACTURE OF ITS JUICE INTO SUGAR—
NATIVE METHOD OF CULTIVATION IN BENGAL—EXTRACTION OF THE
JUICE—MANUFACTURE—COST AND PROFITS OF CULTIVATION—NATIVE
SUGARS, KAUR, NIMPHOOL, DOOLOO, GURPATT, AND DOBARAH—EURO-
PEAN REFINERIES FOR DATE SUGARS AT CALCUTTA.

I have already made mention of this palm in Part I. as being likely to prove a great boon to colonists in Tropical Australia, and promised details respecting its cultivation. The Bengal Palm from the juice of which sugar is made, is the same variety as that which supplies the date of commerce, but the trees have become so deteriorated by neglect, and, perhaps, by change of soil, that they no longer produce an edible fruit. The best account of the Arabian Date Palm in its highest condition with which I can present the reader is that of the Rev. H. B. Tristram in his work on the Great Sahara, who found it growing abundantly at Laghouat, an Arab town on the border of the desert. His description is as follows:—"But the principal source, both of wealth and subsistence, here as in all the oases, are the gardens, of which there are 391, all watered by the Wed Djidi, whose stream is intercepted by a dam just below the groves. These gardens yield three simultaneous crops. First of all the closely

planted surface supplies carrots, onions, melons, pumpkins, cucumbers, red pepper, tomatoes, beans, maize, cauliflowers, &c., which flourish luxuriantly under the thick shade. Over these rise a dense mass of fruit trees—apricot, peach, almond, quince, and many trellised vines, and, above all, a second dome of date-palms (djereed). The taxes are raised by a small payment for each fruit-bearing tree, and, besides 20,000 female, and 500 male palm trees, the last census gave 26,000 apricot, 6,600 peach trees, 24,500 figs, 1,300 quinces, 2,400 pomegranates, 800 pears, and 1,100 trellised vines. A considerable quantity of "hermez" or dried apricots are exported, but the date-palm is the most carefully cultivated. The male trees blossom in the month of March, and about the same time the case containing the female bud begins to open. To impregnate these a bunch of male flowers is carefully inserted and fastened in the calyx. Towards the commencement of July, when the fruit begins to swell, the bunches are tied to the neighbouring branches."

"The dates are ripe in October, at which time any premature rain is fatal to the crop, much as water is daily required at the roots. Not less pernicious are the north and east winds in March and April. The best trees are those produced from slipped plants. Those from seed are much longer in arriving at maturity, and are generally poor. When the slip, taken from the foot of the stem of an adult tree, is first planted, it must be watered daily for six weeks, after which the trees are watered once a week in summer, and every month in winter. They begin to bear when eight or ten years old, being then about seven feet high. Each year the lowest ring of leaves falls off, so that the age of the palm may be roughly calculated by the notches on the stem. It will live for at least 200 years, but after a century its fruit begins to decline, and it is generally then cut down for building purposes; for its timber, however worthless in itself, is prized in a country where there is no other wood whatever. Some trees produce as many as twenty bunches, but the average of a good year is from eight to ten bunches, each weighing from 12 lbs. to 20 lbs. Each proprietor has a right to one or two hours water in the day from the stream which passes by his grounds, and this right is always specified in the tittle-deed by which he holds his garden. Before the dates are ripe, each family is bound to set apart one tree, all the fruit of which is consecrated for the service of the mosque and the use of the poor."

"From the juice of the palm-tree is made a liquor called "laguni," of which the Arabs are very fond, although it is fer-

mented, but which, to my palate at least, is very sweet and insipid. It is produced by simply making an incision in the top of the tree, taking care to reach the centre. A funnel is attached, by which the sap flows into a vessel, and the palm thus yields about ten quarts every morning. A tree may be bled for two months, if the incision be freshly opened every day, to prevent the healing of the wound.* The operation will kill the plant if continued too long, but, cautiously practiced for a few days, will often invigorate a sickly or ill-bearing palm, like the pruning of our fruit trees."

"The cabbage, or heart of the date tree, is also eaten, and the taste approaches to that of the chesnut though it reminded me more of the sweet potato of the West Indies. But the cabbage is never cut, except when the tree has fallen or been felled, as the loss of its crown invariably destroys the plant."

"The Arabs count fifteen varieties of dates, of which the deghetnour is considered the best for keeping; and three other kinds are preferred fresh." (p. 95).

The Date-palm of Bengal is supposed to have been originally produced from the seed of the Arabian Date-palm, as it closely resembles the latter in every respect excepting the inferiority of the fruit, the seed of the Bengal palm being covered only with a thin skin which is scarcely edible. It was probably this inferiority in the fruit that led to the tree being tapped to obtain the juice for the manufacture of sugar, a branch of industry that has latterly become of such importance as to induce the Agricultural Society of Bengal in 1858 to offer a prize for the best essay on the cultivation of the Bengal date-palm, and the manufacture of the juice into sugar. The prize was awarded to Mr. S. H. Robinson, who seems to have given great attention to the subject, and I shall take the liberty of extracting largely from his essay, which was published the following year, as, from the circumstances, it must be considered as the very highest authority on this new and important branch of industry.

* The entire process is identical with that pursued in Bengal, where the date-palms are tapped to obtain the juice from which sugar is made, as will be seen further on.

[Extracts from Mr. S. H. Robinson's Prize Essay on the Cultivation of the Date Tree, and the Manufacture of its juice into Sugar.—Calcutta, 1859.]

DESCRIPTION OF THE TREE.—“*Phoenix* the genus to which the Date Palm belongs, comprises nine known species, of which 6 are indigenous in India, and are distinguished as: 1, *acaulis*; 2, *Ouseleyana*; 3, *pedunculata*; 4, *farinifera*; 5, *sylvestris* or *dactylifera*; 6, *paludosa*. Of these, No. 4 produces sago of an inferior quality;—and from all the species the leaves furnish materials for mats or thatch for houses. The sugar yielding variety, *Phoenix sylvestris*, is known as the wild date of Bengal: *Phoenix dactylifera* is the name given to the true Date Palm of Arabia and Africa, but as it appears to be undistinguishable from the Bengal variety, except in size and vigor of growth, there seems little doubt that any apparent difference is due only to superior cultivation and variety of climate or soil; and it being always a cultivated tree in Bengal, the specific name *sylvestris* may have been originally given, owing to its inferiority in size to the African or Arabian tree, with which European botanists were more early familiar.”

“The Date Palm, when not stunted in its growth by extraction of its juice for sugar, is a very handsome tree rising in Bengal from 30 to 40 feet in height, with a dense crown of leaves, spreading in a hemispherical form from its summit: these leaves are from 10 to 15 feet long, and composed of numerous leaflets or pinnules about 18 inches long. The trunk is rough, from the adherence of the bases of the falling leaves, which serves to distinguish it at a glance from the smooth-trunked coconut palm, which in its leaves only it resembles. Like all of the *Phoenix* genus the trees are diœcious; and the fruit hangs in dense bunches from the centre of the crown of the female tree: it flowers about April or May, and the fruit ripens in July or August; the latter is however of a very inferior description in Bengal, and is seldom gathered except for its seed, from which the young trees are raised. The fruit indeed consists more of seed than of pulp, and altogether is only about one-fourth the size of the Arabian kind brought annually to Calcutta for sale, and when fresh imported, a rich and favorite fruit there. This inferiority of the Bengal fruit may no doubt be attributed to the entire neglect of its improvement there from time immemorial, and perhaps in some measure to the practice of tapping the trees for their sap, so universally followed in the districts around Calcutta, its principal range of growth.”

“The Date tree is met with in almost every part of Bengal Proper, but it flourishes most congenially, and is found plentifully, only in the alluvial soils which cover its southeastern portion, excepting only such tracts as suffer entire submersion annually from the overflow of their rivers, as is common in portions of the Dacca, Mymensing, and Sunderbudd districts. The extent of country best suited for its growth, and over which it is found most plentifully as above indicated, may therefore be taken as within an area stretching east and west about 200 miles,

and north and south about 100 miles, and comprehending by a rough estimate about 9,000 square miles,—within an irregular triangular space.*

NATIVE METHOD OF CULTIVATION.—"It has been mentioned in a preceding page that the date tree is always cultivated in Bengal; so little care and labour are however bestowed on the trees after they are planted out by the native ryots, that the cultivation they receive is of a very limited character. The young plants are raised from seed sown during the rains, and are ready for planting out in the following April or May, after the first showers of the season have moistened the ground sufficiently. Before the date sugars became important as a staple for export, and the cultivation extended, the trees were seldom seen planted elsewhere than along the hedge-rows or boundaries of the fields, or on other spots where they did not interfere with the growth of cereals or other field crops. Gradually as date produce became more valuable, systematic plantations appeared, and fields were set with trees 10 to 15 feet apart, but without much regard to order or regularity of distance. After planting no manuring or further expence was incurred, except perhaps in supplying fresh plants in place of those destroyed by cattle."

"The spaces between the trees are generally occupied by oil-seed or other dry weather crops, and thus the cost of a Native plantation is reduced, whilst the trees benefit by the ploughing, which loosens the earth, and the ground is kept free from weeds."

"The usual computation of the Native cultivator is that a beegah of ground should contain two puns of eighty each, or 160 trees. On a standard beegah of 14,400 square feet this would require the trees to be planted about 10 feet apart. The cost per beegah so planted to cover expenses of the first five years, during which no produce is obtained from the trees, may be reckoned as follows:

	R.	A.	P.
Cost of 160 young plants,	1	0	0
Planting,	1	0	0
Half* the rent at 2 Rs. per annum,	1	0	0
Ploughing 4 ans., weeding 8 ans., in all Rs. 1-12 for 5 years, is,	8	12	0

Total Rs. . . . 10 12 0†

"At the expiry of the fifth year from the planting of the young tree in the field, it is ready to be tapped for its juice. This is the average time allowed, though it may be varied a year sooner or latter by the difference of soil and climate. The first year a young tree is tapped, it is reckoned to yield only half the usual quantity of juice produced by a full grown tree; for the second year of tapping it is reckoned to

* The other half being chargeable to the crop cultivated between the trees.

† A beegah of land is a square of 120 feet each side, and therefore contains about a third of an acre.

"R. A. P." at the head of the columns of figures indicate Rupees, Annas, and Pice. The Rupee is 2 shillings sterling, and 16 Annas are a Rupee.

yield three-fourths of full average quantity; and it is not till the third year of bearing that it is considered as in full yield."

"The process of tapping and extracting the juice commences about the 1st of November. Some days previously the lower leaves of the crown are stripped off all round, and a few extra leaves from the side of the tree intended to be tapped: on the part thus denuded a triangular incision is made with a knife about an inch deep, so as to penetrate through the cortex, and divide the sap vessels; each side of the triangle measuring about 6 inches, with one point downwards, in which is inserted a piece of grooved bamboo, along which the sap trickles, and from thence drops into an earthen pot suspended underneath it by a string: the pots are suspended in the evening, and removed very early the following morning, ere the sun has sufficient power to warm the juice, which would cause it immediately to ferment, and destroy its quality of crystallizing into sugar."

"A plantation is always divided by the cultivator into seven equal sections, and one such section is cut afresh daily. The cutting is made in the afternoon, and the pot suspended as above mentioned: next morning the pot is found to contain, from a full grown tree, 10 seers of juice, the second morning 4 seers, and the third morning 2 seers of juice;* the quantity exuding afterwards is so small that no pot is suspended for the next four days. On the evening of the seventh day it again comes to the turn of this section of trees to be cut, which is effected by a thin slice being pared from the triangular face, which by again dividing the sap vessels causes the juice to flow afresh as at first. Each section is thus cut in succession, and the process is repeated throughout the goor season, which usually terminates about the 15th February, after which the heat of the weather causes the juice to ferment so rapidly, that it is no more convertible into sugar, and consequently not worth the labour of extraction and evaporation of its water, as molasses only would be the product. Juice produced during the day-time of the cold season is of similar quality, and for the same reason is allowed to run to waste."

"The ordinary date sugar crop season is therefore about three and a half months in duration, reckoning from 1st November to 14th February. A fall of rain however entirely stops the collection of the juice, and the heavy damp fogs to which the date districts are very subject, cause the juice to ferment, and renders it comparatively valueless. From these causes one-fifth must be deducted from the whole period of the season for weather casualties to arrive at the total number of *effective* days for goor yielding, which will thus be found to be about 85 days. Assuming the whole period at three and a half months or 107 days, and dividing these into periods of 7 days for each interval for fresh cutting, we have 15 and $\frac{2}{3}$ ths as the average number of cuttings to each tree, and this multiplied by 16 seers, the quantity of juice yielded during the three days after each fresh cutting, and deducting $\frac{1}{3}$ th from

* The Seer is 14,400 Grains Troy, rather more than 2 lbs. Avordupois, 35 Seers being equal to 72 lbs.—G. W. E.

the total result for casualties of weather as above, we arrive at the total produce in juice from each tree for the whole season, which is thus found to be bazar maunds 4-36-4."*

"If we now multiply the quantity of juice yielded by each tree for the season by 160, the usual number of trees reckoned to a beegah of ground, we have bazar maunds 787-20-13 as the total yield of juice from a beegah, and as ordinary juice yields $\frac{1}{10}$ th of its weight in goor, we thus find bazar maunds 78-30 as the produce in goor per beegah, being nearly 19 $\frac{1}{2}$ seers as the average produce of each tree for the season."

NATIVE METHOD OF MANUFACTURE.—"Let us now proceed to examine the mode of preparing the goor, or first raw product from the juice, and the cost of the process."

"Daily at sun-rise throughout the goor season, the industrious ryot may be seen climbing his trees, and collecting at a convenient spot beneath them the earthen pots containing the juice yielded during the past night. Under a rude shed, covered with the leaves of the date tree itself, and erected under the shade of the plantation, is prepared the boiling apparatus to serve for the goor season. It consists of a hole of about three feet diameter sunk about two feet in the ground, over which are supported by mud arches, four thin earthen pans of a semi-globular shape, and 18 inches in diameter, the hole itself is the furnace, and has two apertures on opposite sides for feeding in the fuel, and for escape of the smoke. The fire is lit as soon as the juice is collected, and poured into the four pans, which are kept constantly supplied with fresh juice as the water evaporates, until the whole produce of the morning is boiled down to the required density. As the contents of each pan become sufficiently boiled, they are ladled out into other earthen pots or jars, of various sizes, from 5 to 20 seers of contents, according to local custom, and in these the boiled extract cools, crystallizes into a hard compound of granulated sugar and molasses, and is brought to market for sale as *goor*."

"The fuel mostly employed for the boiling process is the soondree wood (*Heritiera minor*) which forms the principal part of the wild tree vegetation of the Soonderbunds, and, from their contiguity to all the date districts, it is supplied as a cheap fuel to every part of them. The under-leaves stripped from the date trees form a part of the fuel used also. Next to the cost of labor in the process, the cost of the fuel is the most expensive item in the production of the goor by the native method. It is reckoned that for boiling the juice throughout the season from one beegah of ground or 160 trees, 400 maunds of soondry wood are required, in addition to the dried date tree leaves, which at 5 Rs. per 100 mds., which is probably an average rate in and near the Soonderbunds, gives 20 Rs. per beegah."

"In estimating the cost of the goor an annual charge must be included in the calculation for the expenses of the plantation. It was shewn at page 254 that the aggregate cost to the ryot for the first five years

* The bazar maund is equal to 82 $\frac{1}{2}$ lbs. and $\frac{3}{4}$ ths, Avoirdupois.—G. W. E.

was Rs. 10-12; but as no further ploughing and weeding are given after the trees commence yielding, which they do from that time throughout an average period of 20 years, we may assume one rupee per beegah per annum as an ample representation to the ryot for the actual labor of cultivation." * * *

THE NATIVE DATE SUGARS, AND THE MODES OF THEIR MANUFACTURE FROM GOOR.—“The estimate of annual production and exports of date sugars given in Section II,* referred only to such descriptions of the produce as had been cured or refined, and must be distinguished from the *goor*, or first product from the tree, as prepared by the cultivators by boiling and evaporating the water present in the sap. The subsequent processes by which the *goor* is deprived more or less of its molasses and impurities, and the drier and more merchantable kinds of sugar are prepared for market, will now be briefly described. These processes are always conducted by a distinct class of operators, who purchase the *goor* from the cultivators, and bring it to various stages of purity and dryness under different denominations.”

“1st. *Khaur* is made by filling the *goor* into coarse sacks or gunny bags, and pressing them between bamboos lashed together, or beneath heavy weights, until 30 to 40 per cent. of the entire weight is forced out in the shape of molasses. The residue is then mixed, packed in clean bags, and is ready for sale.”

“2nd. Fine *Khaur* or *Nimphool* is made by repeating the above process for making *khaur*; the only difference being that the *khaur* is sprinkled and mixed with water before subjecting it to the second packing and pressure. This causes a further portion of the molasses to be washed and separated from the mass, and the product is lighter colored and finer than the *khaur*, and about 50 per cent. only of the original weight of *goor* remains. A third application of the same process is sometimes resorted to, which carries away another 5 per cent. of the original weight, and leaves a residue still drier and lighter colored than the ordinary *nimphool*.”

“In all *nimphool* and *khaur* sugars, however, a certain portion of water or moisture remains, it being never subjected to any sun-drying or other process for evaporating the water, and this renders it liable to deliquesce and sweating through the bags in which it is usually packed. This is especially the case in damp weather, and loss of color and acidity follow in a few weeks.”

“3rd. *Dullooh*, or *Doloo*, is made by filling the *goor* into round baskets or conical earthen vessels holding two to three maunds each. The baskets being of an open fabric, and the cones made with a hole at the apex, the molasses drains from the *goor* into a vessel placed beneath, the process being encouraged by a stratum of 3 or 4 inches thick of a wet grass or aquatic weed called “*seala*” placed on the

* 1792 to 1813, average	550 tons per annum.
1833 "	3,300 "
1837 "	3,700 "
1848 "	15,000 "
1854 to 1853, average	35,000 tons per annum.

surface of the goor. The moisture from this attenuates the molasses in the goor and assists the draining. As soon as the weed is dry it is removed, and the upper stratum of the goor, now deprived of its molasses, is scraped off with a knife to the depth of 2 or 3 inches; and a fresh top of "seala" or wet weed is applied: when dry, a further portion of sugar is cut off as before, and this is repeated until the basket or cone is emptied. The sugar as scraped off is exposed in the sun on mats to dry, and is then mixed and packed for sale; and is, when well made, a dry, light, sand-colored dullooh. Thirty to forty per cent. of produce, varying with the quality of the goor, is made in this way from a given quantity of the latter. The resulting molasses having by the operation of the weed a small portion of the sugar crystal melted with it, is subjected to a boiling to evaporate the water, and an inferior, weak grained, and dark coloured goor is the result: this is again subjected to the weed draining as before, and a further portion of ten to fifteen per cent. weight of the original goor is obtained. Dulloohs, if well dried before being packed, may be kept without deteriorating for several months if the weather be dry; but they always imbibe moisture, and sustain consequent injury from the damp air of the rainy season of Bengal."

"4th. Pucka Cheenee, or Gulpatta, is the Native refined sugar, made by subjecting khaur to a process somewhat resembling that of the English refiner. The khaur is melted in water to the consistency of thin syrup, which is then placed over a fire in an earthen pan, and brought to boiling point, the defecation being assisted by potash temper and sprinkling in of cold water. After scumming, it is filtered through a cotton cloth, and the clarified syrup is then boiled briskly until the water is evaporated to such a degree as to allow the sugar to form a hard crystal as it cools. It is then poured into an earthen cone, and when cold the plug is withdrawn, and the syrup allowed to drain from it, assisted, as in the dullooh process, by the application of the damp weed or seala. As it becomes whitened by the latter, it is scraped off, sun-dried, and packed for sale. The syrup, as it collects from the cones, is boiled up with fresh goor, and produces by the same process an inferior or second quality of gulpatta, and the syrups of the latter are once more boiled alone, and produce a still inferior weak and reddish sugar called by the manufacturers "jerunnee," which is literally "lasts." Gulpatta if well made, and pure from mixture with other kinds, is of a bright and clean aspect, fine and dry; and if protected from the weather will keep without injury throughout the rainy season. The ordinary yield of gulpatta from good goor is reckoned as follows: three maunds of good goor yield of—

	mds.	sr.
First or white gulpatta,	0	20
Inferior or mixed ditto.,	0	10
Syrups or jerunnee,	0	10
Molasses,	1	28
Loss;	0	12

Total, Mds. 3 0

"5th. Dobarah is a quality superior to gurpatta, being a good white, dry, and well crystalized sugar. The process is similar to that of the gurpatta; but the material used being dullooh instead of khaur, a purer sugar is obtained, which much resembles the crushed refined sugar of the European refiner."

"The expence of all the Native processes above described is extremely low, carried indeed to the last stretch of economy. Earthen pottery for boiling and crystallizing vessels, thatched sheds for protection from the weather, and bamboos and gunny-bags the sole substitutes for machinery, the expence of apparatus forms but a small item in the cost of the sugar. The labor forms the most important part of the expence, and next to that the cost of fuel, more especially in the twice-boiled descriptions."

"It remains to notice that a considerable change has come over the business of preparing Native date sugar during the last ten years, arising from increased demands of European sugar refineries in the vicinity of Calcutta, which have encouraged the production of a larger proportion of the date crop in the form of raw material best suited for them to operate upon. These establishments have now been in operation for a sufficient period to prove that they can fulfil their purpose of preparing from the native raw product such qualities of sugar as are suitable for the consumers in the markets of Europe and Australia, and that they can do this with success and profit to the refiners, and with a better return to the shippers, than would be realized by the latter shipping the raw material, bearing the same rates of freight and charges. The experiment has now been fairly tried, and the result clearly arrived at, that the Native refiner, notwithstanding the extremely low cost of his apparatus and economy of labour, cannot compete, in the preparation of the twice-boiled, or refined sugars, with the European refiner operating with the vacuum pan and steam-engine, and above all with the aid of animal charcoal, the most valuable of all agents in modern sugar refining. It is true that the manufacture of Native refined sugars, dobarah, and gurpatta or *pucka cheenee*, is still nominally continued, but on a much reduced scale, and of inferior qualities to the product of a few years back; and it needs no great amount of vaticination to foresee that the art of preparing them, like that of the Dacca muslins of former days, is gradually becoming extinct, and superseded by the more scientific processes of Europe. The town of Santipore, on the Hooghly river, which twenty years ago produced from 20,000 to 30,000 maunds of dobarah sugar, for which it was much celebrated, per annum, now produces but a very insignificant quantity, and that is seldom seen in the market; and of gurpatta or *pucka cheenee*, but very little of good or genuine description is seen in Calcutta; the bulk of what is brought to market under those names, being now-a-days largely adulterated with dullooh or nimphool sorts, to reduce them to a price suited to the refiner for his use as raw material, either in Calcutta or in Great Britain."

The process so well described by Mr. Robinson is that by which the best sugar was made before European skill was brought to bear upon the manufacture, and I have lately observed a tendency on the part of sugar planters to return to the old practice. In Java, for example, the use of the centrifugal machine, which converts syrup into marketable sugar with astonishing rapidity, and effects an immense saving of labour, has been discontinued in favour of the conical earthen pots described by Mr. Robinson at page 149. But it is the simplicity and cheapness of the native process that will most interest the colonist, as the Date is not the only palm that yields sugar, although it is probably best suited for cultivation on a large scale. Indeed nearly every variety of palm produces a saccharine juice in greater or less abundance, and we find that those which happen to be most available are used by the natives of different regions for the manufacture of sugar. Among the Malays, for example, the Nipa palm, which will be described in the next Section, is used to the exclusion of all others. In Java, the *Arenga saccharifera* is the chief sugar palm; in the Philippines, the *Corypha* palm; in the Moluccas, the *Borassus gomutus*; and in Timor and the neighbouring islands, where the syrup is often the chief sustenance of the natives during seasons of protracted drought, the Lontar, (*Borassus fabelliformis*), furnishes the sole supply. All the palms mentioned above, with the exception of the Nipa and the Coconut, prefer the interior to the sea coast. The only one of the number indigenous to Australia is the *Corypha* palm, which abounds in several districts of the tropical region, and I have no doubt that excellent sugar could be made both from this and from the *Seaforthia* palm, which is even more abundant. But I strongly suspect that the Bottle Tree, sometimes called the "Gouty-stemmed" tree, a *Sterculia*, will turn out to be the great sugar-producing tree of Tropical Australia. Its stem yields in tolerable abundance a rich saccharine juice, and although I never tried the actual experiment of boiling it down into sugar, I should have considered success as certain had the failure of supplies led to the necessity of resorting to the process. The pith of this tree also yields sago. Dr. Leichhardt's companions discovered some of its properties at an early stage of their expedition, as appears from the following extract. "The scrub was occasionally more open, and fine large bottle trees (*Sterculia*) were frequent: the young wood of which, containing a great quantity of starch between its woody fibres, was frequently chewed by our party." (*Journal*, p. 24.)

SECTION VI.

THE NIPA PALM.

ITS RANGE—MODE OF GROWTH—ATTAP OR NIPA THATCH—THE TREE NOT FOUND IN AUSTRALIA—NIPA SUGAR—MODE OF MANUFACTURE—LOCALITIES BEST SUITED FOR THE GROWTH OF THE PALM.

This palm, (*Nipa fruticans*) which is classed with the screw-pines, grows spontaneously throughout the Indian Archipelego about the inner margins of the mangrove belts, and along the banks of rivers within the influence of the tides. It is also cultivated to a certain extent, more especially in Province Wellesley, the process, however, being simply dibbling the young plants into the mud at distances about 12 feet apart, after which they are allowed to take care of themselves. The plant is an enormous bulb, which sometimes attains a diameter of six feet, and the spikes shoot up into leaves not unlike those of the coconut, but much longer, from fifteen to thirty sprouting from a single bulb. The fruit, which is a sort of cone, of the size, and nearly of the form of a five-gallon keg, grows on the end of a spathe, like that of the coconut, which shoots out from the interior of the bulb. The long leaves, of which two crops are produced in the course of a year, are much prized for the manufacture of *attap*, a material in general use for thatching houses, and considered superior to any other description of vegetable covering for buildings, from its lightness and durability, and from its being less ignitable than other kinds of palm leaves. The *attap* is made from the fronds or leaflets which are stripped from the leaf-stem, and are then

doubled over a lath of split nibong palm six or eight feet long, and so arranged as to present an even surface. The leaflets are kept in their places by a stitching of split rattan. The flakes are then dried and arranged into bundles, with the ends of the leaves inward, so compact that the materials for thatching a good sized house can be stowed in a single large boat. They will even bear shipment to a distant port, and, I have no doubt will form part of the return cargoes of vessels carrying stock to the Indian Islands, when the coolness, lightness, durability, and convenience of this material comes to be known to the colonists. The introduction of the plant itself will speedily follow, as there are many thousands of acres near the coast that cannot be put to any better purpose;—that is to say if it has not already introduced itself;—for although I was never able to discover a single plant after much research, many thousands of living stems must have drifted on the coast in the course of ages, so that I consider it almost a matter of certainty that it will be found growing among the mangroves in more than one locality. The bulb or stem is exceedingly bouyant, and is met with far out at sea more frequently than any other kind of shore drift. The propagation of this plant is also likely to become popular on account of its growth being the first effective step towards reclaiming mangrove jungle. The bulky stems become so many islands raised above the level of high water mark, and the interstices are soon filled up by fallen leaves and drift that has become entangled among them.

If, however, a native of Province Wellesley were asked in what the chief value of the Nipa consisted, he would most likely reply that it lay in the sugar obtained from its juice, for he may never in the course of his life have partaken of any other description of sugar. The mode by which it is obtained is as follows:—The shoot or fruit-spathe when about to flower is cut through at a distance of about two feet from the stem, and an earthen pot is suspended below the end to catch the juice as it exudes. This is always done towards evening, and the juice is collected before sunrise, or it would soon ferment. Each shoot yields about a quart of juice daily for three months, after which another shoot is tapped and the old one tied up and abandoned. The new shoot is used for about three months longer, and the tree is then left for some months to recover itself. The leaves of the stems from which the sap is drawn are not cut. The fruit appears the third year after planting, and before this it does not produce juice or sap. When fresh drawn, the *nira*, as the sap is called,

has an agreeable taste, but is rather too sweet and cloying. It will ferment in the course of a few hours after being drawn, so that the boiling has to take place every day, immediately after the crop has been collected. Simple earthen pots, which are manufactured in the Province in immense numbers, are the vessels used, and it is generally boiled down only to a syrup of the consistence of treacle, but much lighter in colour, which is at once saleable as *manisan*, or "sweetening," in which state it is chiefly used. It is sometimes, but rarely, boiled down into a compact sugar which is made up in little circular cakes, protected on the outside by layers of leaf neatly arranged. A peculiar flavour is perceived if the sugar is used for sweetening tea, but refining would remove this, indeed I think that quite as good sugar could be made from it as from the sugar cane.

The late Colonel James Low, in his Dissertation on the Soil and Agriculture of Penang and Province Wellesley already quoted, estimates the profit derived from a single acre of land planted with *nipa*, and appropriated to the manufacture of syrup or *manisan* at 36 Spanish dollars per annum, after deducting rent, labour of collecting, and cost of manufacture;—and the profits are about the same at the present time, for although *manisan* is dearer now than when Colonel Low wrote, labour has also increased in price in a corresponding degree. I have omitted to mention that all the vinegar consumed by the Malays of Province Wellesley, (five-sixths of the entire population of 64,000) is made of the *nipa* syrup, the unsold portion of the daily crop being appropriated to this purpose.

As this palm grows only in the mangrove swamps, and on the banks of tidal rivers, it is not likely to be of use to colonists engaged in sheep farming, but to those whose occupations may lead them to dwell near the coast it will prove of very great value. It is the best thing to plant in the mangrove jungle after the timber has been cleared off for firewood or other purposes, with the view of raising the level of the land, and it may even be planted among the growing trees without any clearing. The rich green of the leaves, which retain their verdure throughout the year, affords an agreeable prospect when the vegetation of the uplands is browned by drought, while the cover proves highly attractive to wild ducks, whose presence must always be desirable.

SECTION VII.

THE SAGO PALM, COFFEE, COTTON, SUGAR CANE,
CACTUS, AND ALOE.

THE SAGO PALM.—Neither the *Sagus Rumphii*, the pith of which supplies the sago of the Moluccas, nor the *Saguerus Saccharifer* from which the Bornean and Sumatran sago is made, have been found in Australia, but I think it not unlikely that both will be discovered when the margins of the mangrove swamps are better explored. If otherwise, I do not think that their introduction will be of importance, as the *Seaforthia Palm*, which grows spontaneously on the uplands of the north coast, furnishes a sago quite equal in quality to that of the others.

COFFEE.—This plant would not grow at Port Essington, at which I am rather surprised, as it succeeds pretty well on the permatangs or low sand ridges of Province Wellesley, a mile or two from the sea. The inferiority of the produce to that grown on the neighbouring hills, shows, however, where the defect lies. This plant is likely to thrive on the mass of high land at the sources of the Lynd and the Burdekin, where it is likely soon to be tried, as well-to-do colonists will establish their homesteads in this delightful region, leaving their flocks and herds on the plains under the charge of hired superintendents, and they will be glad of some occupation near home in which their spare time may be profitably employed. The uplands of the Arnheim Peninsula, more especially towards Cape Wessel, also appear to be a promising locality.

COTTON.—The experiments made in the culture of cotton at Port Essington were successful as far as they went, showing that the soil and seasons were favourable to the production of the best descriptions of cotton, and that no obnoxious insects existed. But no means were afforded for testing the enterprise on a large scale, which alone would have been perfectly satisfactory. The point was of much more importance twenty years ago than it is now, as at that time it was uncertain whether overland communication with the southern colonies was even practicable, and some exportable production was necessary to supply the place of the wool, tallow, and live stock of the south. Now that so many distinct routes have been explored by which stock can be driven into the tropical region, the occupation of which has already been successfully commenced, colonists are likely to content themselves with pursuits they are familiar with, and which they can carry on without the absolute necessity of importing labour. And as essays on the culture of cotton can be readily obtained by those desirous of trying the experiment, I do not consider it necessary to enter into any details at present, except as regards a point on which success or failure will mainly depend.

I have already in Section II. of Part I. (*page 19*) recommended the planting of fresh seed every year, instead of allowing the plant to grow as a perennial. In tropical countries where there happen to be neither droughts nor periodical floods to destroy the plants after they have yielded the crop, they will produce for several years in succession; and as the crop of the second year is likely to be as great, or even greater, than that of the first, the temptation to allow the plants to remain in the ground is generally too great to be resisted. But the practice is utterly fatal to successful cultivation on a large scale, and I need not go far for an illustration. Throughout the Indian Archipelago, cotton plants will be met with around nearly every native hut, growing as perennials, and the pods are picked as soon as they open, so that sometimes, by the end of the year, three or four pounds of good cotton will have been collected. Nevertheless Java, Bali, and the district of Palembang in Sumatra, are the only countries of the Archipelago which export cotton, and these are also the only countries in which cotton is grown as an *annual*, the seeds being planted in the low lands immediately after the rice crop has been gathered, and the plants are drowned when the periodical rains set in three or four months afterwards. But the intermediate period will have been sufficient to afford a crop

of cotton which not only supplies the requirements for home manufacture, but leaves a surplus for exportation. Certainly the cotton of these countries is not of very good quality, but this is solely owing to the native cultivators being utterly careless with regard to the selection of seed. If the best pods were picked out and put on one side to furnish seed for the next year's crop, as is practiced by scientific cultivators elsewhere, there is scarcely a limit to the improvement that would arise.

It is, indeed, evident that cotton cannot be cultivated with profit as a perennial in any tropical country except where labour is so abundant as to be almost without a pecuniary value. The plants are liable to flower throughout the year, and each tree has therefore to be examined daily for the chance of discovering an open pod. With native cultivators, whose plants are immediately under the eye of the members of their families, this is not an inconvenience, as the picking generally falls to the lot of the children, to whom it affords an amusement almost equal to "birds-nesting;"—but in plantations on a large scale the expense of picking will be found too great to afford a profit on the crop. I am aware that perennial cotton of the *Peruambuco* variety is exported in considerable quantities from the east coast of South America; but the labour employed in collecting the crop is of the very cheapest description, that of slave children for whom there is no other profitable occupation. This case, therefore, can scarcely be put forward as an exception to the greatest rule. It is however, only near the coasts of the tropical region of Australia that there is much risk of the colonist wasting his labour by attempting to grow perennial cotton. In the interior, the drought which succeeds the cool season will answer the same purpose as the floods of Egypt, and the frosts of the Southern States of America, by destroying the plants after the crop has been gathered, and thus removing all temptation to allow them to remain in the ground for the chance of a crop the second year.

THE SUGAR CANE.—This plant grew well at Port Essington, but it required much attention, more especially in the way of irrigation, which was necessary every few days during the dry season. There are many tracts of great extent where irrigation could be employed, and the crops would doubtless prove luxuriant, but here again the question of labour stands in the way, there being other branches of industry in which it could be more profitably employed until the time arrives when an abundant population will admit of the cultivation being followed with a certainty of success.

THE CACTUS.—Several varieties of this tribe might be introduced into Tropical Australia with great advantage, more especially the prickly pear, which abounds on the neighbouring island of Lombok, where it is used in the construction of live fences, which are perfectly impervious to cattle and all other quadrupeds larger than a rat. It might also prove useful in the event of a very severe drought, for the branches chopped up so as to blunt the spines are much relished by horses, cattle, and sheep, which last, indeed, may be kept alive upon it for weeks, without water or any other description of food. The *Opuntia cochinellifera* on which the Cochineal insect feeds has been successfully introduced into Java, together with the living insect itself, and an extensive government plantation has been formed near Banyuwangi, at the east extreme of Java, where cochineal is produced equal in quality to that of South America. I visited this plantation in the year 1855, and was surprised at the success that had attended the introduction of a product which naturalists thought would be confined for ever to the continent on which it was originally produced.

THE ALOE.—This plant might also be introduced with advantage, for although not of great value as furnishing an article of commerce, it will grow on spots where no other plants will flourish, and its leaves would be available, like those of the cactus, in seasons of severe drought.

Colonists desirous of embarking extensively in tropical agriculture should procure a copy of Mr. Crawford's History of the Indian Archipelago, which contains much valuable information respecting the marketable productions of the neighbouring countries:—and a series of the Journal in which this Handbook appears would be found eminently useful and instructive.

SECTION VIII.

THE TEA PLANT.

CULTIVATION OF THE TEA PLANT IN BRITISH INDIA—SOIL AND CLIMATE
SUITED TO ITS GROWTH—MANUFACTURE OF THE LEAF IN CHINA—
GATHERING THE LEAVES—DRYING PANS—PROCESS OF HEATING AND
ROLLING THE LEAF—AIRING—DRYING FOR EXPORTATION—SMOKING FOR
HOME USE—SORTING—DYEING TEAS FOR EXPORTATION—THE AUSTRALIAN
TEA TREE.

The cultivation of Tea in British India has lately become an important branch of industry, and upwards of a hundred new plantations have been laid out by Europeans within the last three years. The celebrated Assam Tea, which has afforded enormous profits to the Company employed in its production, is made from the *Thea Assamica*, a variety differing from those of China, having larger leaves and a larger stem. The Chinese Tea Plant (*Thea viridis*), from which the teas exported to Europe are made, was introduced by the East India Company about the year 1849, and the cultivation was commenced in the Himalayan region, where, in 1851, there were upwards of 600 acres of public lands covered with plants, besides a considerable extent belonging to the neighbouring Zemindars. The manipulation and manufacture of the leaf proved to be an easy process, and the produce is considered by many to be even superior to the teas of China. Hence the great attention that has been paid of late years to the cultivation of this valuable product.

The plant appears to grow well in any climate that is not too cold, and it cannot be very particular in regard to soil, as that of the black tea districts in the neighbourhood of Canton is said to contain 84 per cent of saliceous sand, a quantity of carbonate of iron and alumina, and only 1 per cent of vegetable matter. Further north, the soil is a gravelly loam, and in the great tea districts about the parallel of 30° N., the soil is described by Mr. Fortune as being rich. This gentleman gives a very full description of the mode of manufacturing the tea, but it is too long to extract entire. The process seems to be easily acquired. Mr. Fortune says:—"The mode of gathering and preparing the leaves of tea-plants is extremely simple. We have been so long accustomed to magnify and mystify everything relating to the Chinese, that, in all their arts and manufactures, we expect to find some peculiar and out of the way practice, when the fact is, that many operations in China are more simple in their character than in most other parts of the world. To rightly understand the process of rolling and drying the leaves, which I am about to describe, it must be borne in mind that the grand object is to expel the moisture, and at the same time to retain, as much as possible, of the aromatic and other desirable secretions of the species. The system adopted to attain this end is as simple as it is efficacious."

"In the harvest seasons the natives are seen in little family groups on the side of every hill, when the weather is dry, engaged in gathering the tea leaves. They do not seem so particular, as I imagined they would have been, in this operation, but strip the leaves off rapidly and promiscuously, and throw them all into round baskets made for the purpose out of split bamboo or rattan. In the beginning of May, when the principal gathering takes place, the young seed vessels are about as large as peas. They are also stripped off and dried with the leaves; it is these seed vessels which we often see in our tea, and which have some slight resemblance to young capers. When a sufficient quantity of leaves are gathered, they are carried home to the cottage or barn where the operation of drying is performed.

* * *

"The drying pans and furnaces in these places are very simply constructed. The pans, which are of iron, and are made as thin as possible, are round and shallow, and, in fact, are the same, or nearly the same which the natives have in general use for cooking their rice. A row of these are built into brick work and

chunam (mortar), having a flue constructed below them, with the grating, or rather fire-place at one end, and the chimney, or, at least, some hole to allow the smoke to escape, at the other. A chimney is a secondary consideration with the Chinese, and in many instances which came under my observation the smoke, after passing below the drying pans, was allowed to escape, as it best could, through the doors and roofs of the houses, which, indeed, in China, is no difficult matter."

"When the pans are first fixed, the brick-work and chunam are smoothed off very neatly round their edges and carried up a little higher, particularly at the back of the pans, at the same time widening gradually. When complete, the whole has the appearance of a row of large high-backed basins, each being three or four times larger than the shallow iron pan which is placed at its bottom, immediately over the flue. When the fire is applied, the upper part of these basins, which is formed of chunam, gets heated as well as the iron pan, though in a less degree. The drying pans thus formed, being low in front, and rising very gradually at the sides and back, the person, whose duty it is to attend to the drying of the leaves, can readily manage them, and scatter them over the back of the basin."

"The leaves having been brought in from the hills, are placed in the cottage or drying house. It is now the duty of one individual to light the little fire at the end of the flue, and to regulate it as nicely as possible. The pans become hot very soon after the warm air has begun to circulate in the flue beneath them. A quantity of leaves, from a sieve or basket, are now thrown into the pans, and turned over, shaken up, and kept in motion by men and women stationed there for this purpose. The leaves are immediately affected by the heat. They begin to crack, and become quite moist with the vapour or sap which they give out on the application of the heat. This part of the process lasts about five minutes, in which time the leaves lose their crispness, and become soft and pliable. They are then taken out of the pans and thrown upon a table, the upper part of which is made of split pieces of bamboo. Three or four persons now surround the table, and the heap of tea leaves is divided into as many parcels, each individual taking as many as he can hold in his hands, and the rolling process commences. I cannot give a better idea of this operation than by comparing it to a baker working and rolling his dough. Both hands are used in the same way; the object being to express the sap or moisture, and at the same time to twist the leaves. Two or

three times during the operation the little bundles of rolled leaves are held up and shaken upon the table, and are then again taken up and pressed and rolled as before. This part of the process also lasts about five minutes, during which time a large portion of the green juice has been expressed, and may be seen finding its way down between the interstices of the bamboos. The leaves being now pressed, twisted, and curled, do not occupy a quarter of the space which they did before the operation."

"When the rolling process is completed the leaves are removed from the table and shaken out for the last time, thinly, upon a large sort of screen, also made out of split bamboo, and are exposed to the action of the air. The best days for this purpose are those which are dry and cloudy, with very little sun, the object being to expel the moisture in the most gentle manner, and, at the same time, to allow the leaves to remain as soft and pliable as possible. When the sun is clear and powerful the moisture evaporates too rapidly, and the leaves are left crisp, coarse, and not in a proper state to undergo the remaining part of the process. There is no stated time for this exposure, as much depends on the nature of the weather and the convenience of the work-people; sometimes I have seen them go on with the remaining part of the operation without at all exposing the leaves to the air."

"Having in this manner got rid of a certain part of the superfluous moisture, the leaves, which are now soft and pliant, are again thrown into the drying-pans, and the second heating commences. Again one individual takes his place at the furnace, and keeps up a slow and steady fire. Others resume their places at the different drying-pans—one at each—and commence stirring and throwing up the leaves, so that they may all have an equal share of the fire, and none get scorched or burned. The process of drying thus goes on slowly and regularly. This part of the operation soon becomes more easy, for the leaves, as they part from their moisture, twist and curl, and consequently take up much less room than they do at first, and mix together more readily. The tea leaves being now rather too hot for the hand, a small and neat brush, made of bamboo, is used instead of the fingers for stirring them up from the bottom of the pan. By this means the leaves are scattered above on the smooth chunam-work, which forms the back of the drying-pan, and, as they roll down on this heated inclined plane they dry slowly, and twist at the same time. During this operation the men and

women who are employed never leave their respective stations, one keeps slowly feeding the fire, and the others continually stir the leaves. No very exact degree of temperature is attempted to be kept up, for they do not use the thermometer, but a slow and steady fire is quite sufficient; that is, the pan is made and kept so hot that I could not place my hand upon it for a second of time. In order to get a correct idea of the time required to complete this second part of the process, I referred to my watch on different occasions, and at different tea farms, and always found that it occupied about an hour; that is, from the time the leaves were put into the pan after exposure to the air, until they were perfectly dry."

"When the operation of drying is going on largely, some of the pans in the range are used for finishing the process, while others, and the hottest ones, are heating and moistening the leaves before they are squeezed and rolled. Thus a considerable number of hands can be employed at once, and the work goes on rapidly without loss of time or heat, the latter of which is of some importance in a country so ill provided with fuel."

"The tea prepared in the manner I have just described is greenish in colour, and of a most excellent quality. It is called by the Chinese in the province of Chekiang, *Tsaou-tsing*, or the tea which is *dried in the pan*, to distinguish it from the *Hong-tsing*, or that kind which is dried in flat bamboo baskets over a slow fire of charcoal."

"This latter kind—the *Hong-tsing*,—is prepared in the following manner:—The first process, up to the period of rolling and exposure to the air, is exactly the same as that which I have just described, but instead of being put into the drying-pan for the second heating like the *Tsaou-tsing*, the *Hong-tsing* is shaken out into flat baskets, which are placed over tubs containing charcoal and ashes. The charcoal, when ignited, burns slowly and sends out a mild and gentle heat. Indeed the only difference between the two teas consists in the mode of firing, the latter being dried less and more slowly than the former. The *Hong-tsing* is not so green in colour as the *Tsaou-tsing*, and I believe has rarely been exported."

"After the drying is completed the tea is picked, sifted, divided into different kinds and qualities, and prepared for packing. This is a part of the operation which requires great care, more especially when the tea is intended for the foreign market, as the value of the sample depends much on the "smallness and evenness" of the leaf, as well as upon its other good qualities.

In those districts where the teas are manufactured solely for exportation, the natives are very particular in the rolling process, and hence the teas from these districts are better divided and more *even*—although I should doubt their being really better in quality—than they are in the eastern parts of the province of Chekiang. When they have been duly assorted, a man puts on a pair of clean cloth or straw shoes, and treads the tea firmly into baskets or boxes, and the operation is considered complete, as far as the grower is concerned."

"I have stated that the plants grown in the district of Chekiang produce green teas, but it must not be supposed that they are the *green* teas which are exported to England. The leaf has a much more natural colour, and has little or none of what we call the "beautiful bloom" upon it, which is so much admired in Europe and America. There is now no doubt that all these "blooming" green teas, which are manufactured at Canton, are dyed with prussian blue and gypsum, to suit the taste of the foreign "barbarians," indeed, the process may be seen any day, during the season, by those who will give themselves the trouble to seek after it. It is very likely that the same ingredients are also used in dyeing the northern green teas for the foreign market; of this, however, I am not quite certain. There is a vegetable dye obtained from *Isatis indigotica* much used in the northern districts, and called *Tein-ching*, and it is not unlikely that it may be the substance which is employed."—(*Fortune's Wanderings in China*," p. 203 *et seq.*)

The smoking process appears to be attended with much less labour and expense than the stove drying, and the produce seems to be well adapted for home consumption. The shallow iron pans required for the more complicated process are exported in immense numbers from China, and can be purchased in all the ports of the Archipelago, where they go by the name of "qualies" and are in general use among all classes. There seems to be nothing peculiar in the cultivation of the tea plants. They are planted in rows about four feet apart, and the same distance between each row. The soil of the Quantung or Southern province is generally very poor and sandy, That of Hokien and Chekiang the middle and northern tea districts, is a "rich sandy loam."

I have extracted more copiously from Mr. Fortune's valuable work than I should otherwise have done, as it may prove worth while for the colonist to experiment on the leaves of the Australian Tea Tree (*Melaleuca*) several varieties of which are distributed throughout the continent, and in the tropical region it

covers nearly as much country as the Eucalyptus itself. The leaves even of the larger varieties, have an agreeable aromatic flavour, and those of the smaller kinds were in general use among the earlier colonists of New South Wales as a substitute for tea when supplies of Chinese produce failed, which occurred often and for long periods at a time;—indeed some members of the old convict population acquired such a taste for the colonial tea that they are said to have preferred it to the imported article. The tea plant of Assam is very different in appearance from that of China, but experiment showed it to be capable of manufacture, and Assam Tea has in the course of a few years become almost a necessary of life to those who are habituated to its use. The celebrated Paraguay Tea in general use throughout South America is the leaf of a plant belonging to the same Natural Order as the Holly of Europe.

NOTE TO SECTION II.

(The Camel.)

On reading this section since it was printed it struck me that the details respecting the Bokhara camel were insufficient, considering the importance of the subject, and that settlers in the bush of Australia have neither intelligent native travellers, nor an extensive assortment of Oriental works to refer to for further particulars. I have therefore looked up the authorities on this region, but with no great amount of success. The Journal of Mr. Moorcroft, whose attention was especially turned towards the discovery of fine wools, unfortunately ends with his arrival at Bokhara. Sir A. Burnes did not visit the country of the Hasarahs, who are the chief breeders of the fine woolled camel, but he found some thousands of this people in the city of Bokhara, where they perform all the heavy work. They are of Mongolian origin, indeed are perfect Tartars, although the chief seat of the tribe, which consists of 67,000 families, lies between the parallels of 34° and 36° , two degrees to the south of Bokhara, and close to the northeastern frontier of Persia. It is here that the manufacture described by Mr. Ferrier is carried on. Sir A. Burnes does not appear to have been aware that the Hasarahs possessed camels. In his last work, published after his death, he says that their property "consists of sheep; and they manufacture from their wool good carpets, and also a fabric called "burruk" (*Cabool in 1836-7*, and 8, p. 232.) This last is evidently the *barek* mentioned by Mr. Ferrier. Sir A. Burnes thus describes the camel he met with in the neighbourhood of the capital of Bokhara, which appears to be of the same breed as that of the Hasarahs: "In a country surrounded by deserts, the camel is an animal of the first importance: they are very numerous; and the whole traffic of Bokhara is carried

on by means of them. They bear a high price; a good one cannot be purchased under sixty or seventy rupees. The condition and appearance of the camel here differ from what is seen in India and Cabool, where they are often covered with eruptions, and almost destitute of hair. At Bokhara, on the other hand, they have a sleek coat, as fine as that of the horse, and shed their hair in summer; from which a fine water-proof cloth of close and rather heavy texture is manufactured. It is called "oormuk," and retains the natural colour of the camel, I imagine that these camels owe their superiority to the climate, and the congenial thorny food, which is so abundant. This animal always thrives best in a dry country, and is very impatient under heat. They will travel with ease for fourteen consecutive hours; but their keepers never march during the day if it can be avoided. It is erroneous to believe that the camel can subsist for any great number of days without water. In summer they suffer much after the second day; and in winter they will only travel without it for double the time. The food of the camel is most cleanly; but nothing can be more offensive than the effluvia which proceeds from its stomach. The journeys performed, even with our caravan, bespeak the great hardihood of these animals. In one instance we travelled seventy miles in forty-four consecutive hours, including every halt. Our usual marches were thirty miles: and the camel scarcely ever travels more than two miles in the hour. The Bactrian camel, which has two humps, abounds in Toorkistan: they are bred by the Kuzzaks of the desert north of Bokhara. They have a fringe of long black hair under their neck, with a clump of it on both thighs, and are really pretty for a camel. In stature they are lower than the common camel or dromedary, yet they bear greater burdens by 140 pounds: the one carrying 640, and the other but 500 pounds English. I am assured that a most strong and useful breed of camels is reared by a cross between the two. The issue of these have but one hump.—(Burnes' "*Travels into Bokhara*," vol II, p. 176).

I have been unable to obtain any information as to the average weight of the fleeces of Bokhara camels, or whether the Hasarahs shear the wool instead of allowing it to drop off when the animal sheds its coat. These are points of interest, for if the Hasarahs have not improved their fleeces by shearing, and the weight happens to be considerably less than that of the Mongolian animal, it may prove most advantageous to import the latter for stock-breeding. The neglect with which the fleece of the

The Camel of Bokhara.

Mongolian camel has been hitherto treated is no proof of its want of value, for according to Sir A. Burnes it is only lately that the goat wool of Bokhara has been used for any other purpose than that of making cordage:—"In the animal kingdom, the sheep and goats of Bokhara claim the first notice, since the one yields the celebrated skins, and the other a description of shawl wool, only inferior to that used in Cashmere. The flocks graze on furze and dry grass; and their flesh is sweet and well flavoured. * * *

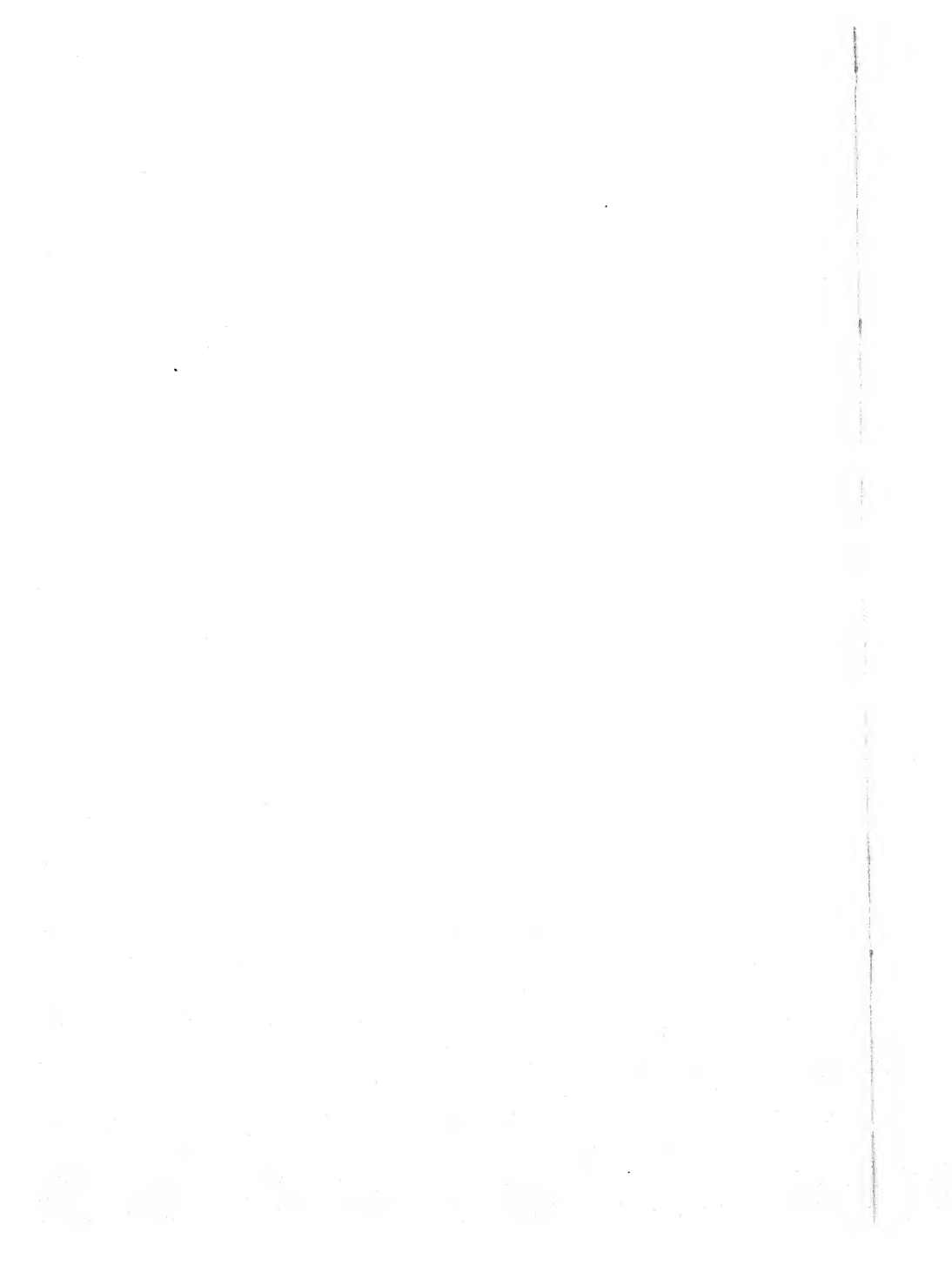
The goats of Bokhara, which are to be found among the wandering Kirgisses, yield the wool to which I have alluded: but these people were quite ignorant of its value till a late period; and yet manufacture it into ropes to bind their horses and cattle.—(Burnes' *Bokhara*, vol. II. p.p. 173 & 175).



PART IV.

ECONOMICS.

SECTION I.—INDUSTRIAL PURSUITS, SOURCES OF LABOUR,
AND MARKETS FOR PRODUCE.



SECTION I.

INDUSTRIAL PURSUITS, SOURCES OF LABOUR
AND MARKETS FOR PRODUCE.

HORSE, SHEEP, AND CATTLE FARMING—PREPARATION OF DINDING—PREPARATION OF HARD-WOOD TIMBER FOR EXPORT—DEMAND IN INDIA—FISHERIES—DESCRIPTION OF A MALAYAN FISHING WEIR—CURING FISH—PROCESS ADOPTED IN S'AM—TREPANG—LABOUR—EUROPEAN STOCK-MEN AND CUNTS—INDIAN COOLIES—SYSTEM OF EMIGRATION TO THE STRAITS SETTLEMENTS—SYSTEM REQUIRED FOR TROPICAL AUSTRALIA—INDIAN COOLIES AT THE MAURITIUS—AT CAYENNE—CHINESE LABOURERS—SPONTANEOUS MIGRATION OF CHINESE—CHARACTER OF THE CHINESE—INDIAN ISLANDERS—NATIVES OF TIMOR, ROTTI, AND SAVU—OF TIMOR-LAUT—OF BALI AND LOMBOK—OF JAVA AND BAWEAN—MARKETS FOR PRODUCE—CONCLUDING NOTE.

Under ordinary circumstances, the colonist in Tropical Australia, like his brethren in the South, will be dependent on the natural productions of the country as his chief, if not his sole source of wealth. Capitalists in Europe may be tempted by the adaptability of the soil and climate, and by the facility with which Indian labourers may be obtained, to embark in the cultivation of cotton or other tropical produce;—but the colonist from the South, if left to himself, must be expected to continue the pursuit that has already enriched so many of his neighbours,

namely the rearing of horses, sheep, and cattle on the natural pastures. I am not aware of any single point in which it will be found necessary to carry on the out-of-door operations in a different manner from that already pursued in the south; but the facilities with which Indian labour can be obtained is calculated to lead to great improvements in the preparation of the produce for market. Sheep-washing and shearing, for example, need not be the hasty and imperfect operation which the scarcity of labour compels the colonist to submit to in the south; and an entire revolution may be expected in the necessarily waterful system of "boiling down" the surplus stock for the sake of the tallow. The great demand that exists throughout the East for "Dinding" or dried meat, which cannot be obtained to the extent of more than a tenth of the amount required, will render its preparation a source of great profit, as there is little expense attending it beyond the cost of labour;—the dryness of the atmosphere being so great during the season in which "boiling down" operations will be carried on, that the flesh can be cured even without the use of salt. Both salt and pepper, however, should be applied in small quantities when they can be obtained, as the value of the "dinding" is thereby materially enhanced. All natives of the Indian Islands are well acquainted with the process, which is very simple, and easily acquired.

The preparation of timber, for which Indian labour is also well adapted, must, as a matter of necessity, form part of the economy of every large establishment. And it is also possible that colonists may find it to their interest to collect timber for exportation, at least to the extent required to furnish ballast for the ships employed in transporting their live-stock to a market. Vessels of a small class, carrying their full numbers of horses or cattle, cannot stow any large amount of damageable cargo, and the lower part of the hold is filled with ballast up to the required level, the proportion being about a third of the carrying capacity; that is, a hundred tons of ballast for vessel of 300 tons burthen. Stone or sand, which is of no value whatever after it has served its purpose as ballast, is the material generally used, and as timber for railway sleepers is now and will long continue to be in great demand at all the ports in India which afford a market for live-stock, while at the same time it is far better suited for the purpose than either stone or sand, this description of ballast could be substituted with advantage to all parties concerned. The following advertisement which appeared in the Sydney Herald of the 21st of May last (1862), and

which has been repeated, I believe, in most of the journals published in the colonies, gives the dimensions required and the prices paid at Calcutta.

"EAST INDIAN RAILWAY, CALCUTTA.—This Company is prepared to receive Tenders from firms in Australia for the supply of Railway Sleepers of the following dimensions:—Each sleeper to be not less than 10 feet long, from 12 to 10 inches in breadth, and from 6 to 5 inches in depth. The description of timber the sleepers would be of, and in what proportions they would be supplied, as well as any other particulars as to durability, strength, &c., should be specified, and it would also be well if the English woods to which they assimilate were named. The specific gravity of each kind of timber, and the purposes to which it is generally applied in the colonies, should be stated. The object the Company has in view in inserting this advertisement in the colonial papers is not to provide for immediate requirements, but rather to make it known that the introduction into India of any Australian woods suitable for sleeper purposes at prices lower than indigenous timber can be obtained will probably result advantageously to all. The maximum price paid in India for rectangular sleepers of the dimensions given above, is rupees 3-8, or seven shillings each. Communications should be addressed to the undersigned. EDWARD PALMER, Agent East Indian Railway Company."

Ten sleepers of the full size will exactly amount to a measurement ton, so that a vessel of the class mentioned above could carry a thousand as ballast;—and as the sleepers can be prepared, even if European labour is employed, at a cost of less than two shillings each, while no additional expense would be incurred in shipment, there would be a clear profit on this item of above £ 250; a very important consideration.

The other descriptions of hard-wood timber in most demand in the ports of British India are as follows:—

Telegraph Posts, 15 to 20 feet long, and 8 to 9 inches in diameter.

Piles, 13 inches in diameter, so as to take a square iron head 9 inches each side.

House Beams, 30 feet in length, 12 inches in breadth, and 10 inches in depth.

" " 24 feet in length, 11 inches in breadth, and 9 inches in depth.

The average price at Calcutta of a log of *saul* timber capable

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of giving a beam of 24 feet, and a door frame 12 feet high and 5 feet wide, is 40 Rupees.

In 1859 the E. I. Railway Company, whose advertisement is given above, imported sleepers of fir timber, creosoted, the contract price being Rupees 3-3 or £0-6-4½ each. This was considered to be much lower than the price for which native hardwood timber could be procured. The report of the Chief Engineer of the above Company, dated August 8th, 1859 contains the following passage:—"The demand for timber in India for Railway purposes, more especially for sleepers, in addition to the ordinary requirements of the country, and for Barracks and Public Works, at present very far exceeds the supply, and prices have risen accordingly: and much difficulty is just now experienced in supplying our wants."

The demand in India for timber of all kinds has, indeed, increased to an enormous extent, and it will be well deserving the consideration of the colonist whether he cannot profitably combine the preparation of timber for export with his pastoral pursuits. On the shores of the Gulf of Carpentaria, at least, the pasture lands extend to the very borders of the sea, and hundreds of creeks and small inlets offer convenient ports of shipment. In fact, throughout this extensive region, easy access to a port will be of such primary importance, that the first comers will be greatly influenced by this consideration in selecting their runs. And even those who come late, and have to take up their runs far inland, will find it convenient to have a homestead near the coast, where they can reside when their presence is not required at the station, and attend to the shipment of the produce; a system, indeed, which has been adopted from the first by the large stock-holders in the south.

Another branch of industry to which attention will soon have to be directed is the fishery, as establishments on rather a large scale will be absolutely essential to the prosperity of the country if an Asiatic population is introduced, since fish, either fresh or cured, is an article of daily consumption by all classes of natives. Among the neighbouring islands every man is a fisherman at times, and I have already noticed in Part III, under the head of "Marine Productions," the ingenious contrivance of the Macassar people for taking the smaller kinds of rock fish. I will now attempt to describe the large fishing weirs that I have also alluded to, by which tons of fish, large and small, are often taken at a single turn of the tide. Although these weirs are in use throughout the Archipelago, fisheries of this description are no

where so regular and constant a branch of industry as in Province Wellesley, where the shelter afforded by the island of Pinang enables the fishermen to carry on their labours during the roughest weather. The coast between Pry Point, opposite the town of Pinang, and Batukawan, twelve miles to the south, is absolutely studded with these weirs at distances from each other of two hundred to five hundred yards; and as I have to pass along the entire line every week in the pursuit of my duties, I can speak with confidence as to the immense numbers caught in their trammels;—indeed the take is sometimes so great that the smaller fish are used for manure.

The frame work of the weirs consists of stout poles of sufficient length to stand three or four feet above the level of high water after their lower ends have been driven two and a half to three feet straight down into the mud. The line of poles commences near the beach, and is continued out to seaward at distances of five feet apart until a little beyond the level of low water at spring tides, when a triangular shaped enclosure is formed, with the base towards the line of poles, and the apex to seaward. Two short rows of poles are then carried from the angles at the base of the triangular enclosure in a line with the two upper sides, and the whole affair has now the appearance of an arrow with a large head and very long barbs. A second arrow head enclosure is then made beyond the first enclosure, the point of which enters a little within the base of the second, and the process is continued until there are sometimes five enclosures connected with each other, but the more usual number is three. A netting of split bamboo, sewed with rattan, exactly like the *chiks* or bamboo blinds for windows, is then carried along the entire line of poles, reaching from the ground to above high water level, around each enclosure, and along the rows of poles which form the barbs; but an opening is left in the centre of the base of the first enclosure, by merely fastening together the extremes of the ends of the pieces of bamboo netting that enclose the sides, so that a fish easily forces his way through into the enclosure, but he cannot pass out again, as the ends collapse after he has entered. The fish, therefore, passes into the second enclosure to which he is admitted by a similar contrivance, and so on until he reaches the furthest enclosure or reservoir, from which there is no exit except by the way he entered. The efficiency of this kind of trap is shown by the fact that fish are very rarely found except in the reservoir, and they must consequently have run through the whole course of enclosures and have been unable

to find their way back through a single opening. The line of poles extending from the shore is to intercept the fish in his passage along the coast; when he strikes to seaward until he comes upon the enclosure, and either enters at once or passes along the line of netting forming the barbs, which being looped inwards towards the line of poles, turns him back upon the enclosure. Of course some contrive to escape, but not after they have entered the first enclosure, unless an accident happens to the trap.

A diagram of this rather complicated affair will be found in Plate III. (page 110), which will aid the reader who feels interested in the subject.

The fish are taken out of the reservoir with scoop nets worked by two men, one of whom guides the handle, and the other pulls a rope fixed to the end of the scoop to raise it above the level of the frame of the reservoir, when it is emptied into a boat lying alongside to receive the fish. Low water is always the time of tide chosen for this operation, whether it occurs during night or day.

But although expert fishermen, the Malays are very unskilful, or rather careless, in curing fish, being very sparing in the use of salt, and not removing the back bone, without which large fish cannot be properly cured. The consequence is that the Malayan salt fish are only suited for local consumption, while others are imported in large quantities from Siam in all the principal ports of the Archipelago to supply the demand for ship stores or for exportation, the price per ton being from £30 to £35, while the Malayan article can be obtained for less than half that price. The Siam fish, which is a kind of snapper or rock cod is caught in large numbers near the head of the Gulf of Siam and along the coast on its eastern side. The superiority of the salt fish of Siam is attributable partly to the great cheapness and abundance of salt in that country, but chiefly to the manner in which the fish is cured; and as the process is equally well adapted for fisheries on the coasts of Tropical Australia, I will endeavour to describe it. The fish when taken from the boats are heaped upon a long stage or table, and are then opened by a longitudinal cut along one side of the back bone, while the head is split with a cleaver, and is sometimes cut off altogether. The fish is then spread open, and the entrails carefully removed, after which the back bone is taken out by making two cuts along its sides to divide the ribs, when it is easily stripped out and broken off close to the head. Two or three longitudinal cuts are

also made along the thick parts of the body, penetrating through the skin. The fish is then handed to the salter, who works at a separate stage or table, longer and narrower than the other, and who spreads the fish upon it with the fleshy part upwards, and rubs in a quantity of coarse salt. A second fish is then spread above and salted, the process being continued until the heap contains about twenty fish, when a fresh heap is commenced. The fish are allowed to remain in this state ten or twelve hours, by which time the salt will have thoroughly penetrated, and the greater part of the blood and moisture will have drained out. The heaps are then placed in succession under a simple lever press, where they are well squeezed for a few minutes, and are then spread out on large stages in the open air to dry. The opening and salting generally takes place in the evening, and the squeezing and spreading out in the morning, and as operations are suspended during the rainy season, the fish will have the benefit of a hot sun and a dry sea breeze for an entire day, which is generally found sufficient to cure the smaller fish. A shower of rain falling upon them while thus spread out, would probably destroy the whole batch, as they could never be made to take the salt again so well as when first caught.

It was not originally my intention to include the preparation of trepang among the industrial pursuits suited for colonists, as I had an idea that it would prove distasteful to Europeans, but I have recently learned that for some years past considerable quantities have been collected on the Northeast Coast in the neighbourhood of Torres Strait by a mercantile firm at Sydney well known for its spirit of enterprise; the produce being sent to Singapore, the best market for this singular comestible, as the trepang is assorted there by skilful Chinese, and each variety sent on to the district of China in which it happens to be in highest favour. Curing works on a small scale, such as those described at page 96, will have to be attached to all large fishing establishments, as the collecting of trepang will afford occupation to the fishermen when not otherwise employed, the rainy season presenting no obstruction to operations. And establishments for the express purpose of collecting trepang may prove good speculations, as there are large tracts of coast where the animals have been hitherto undisturbed; the fishers of Celebes and Sumbawa, owing to the limited period available for their voyages, being obliged to confine operations to the north coast from the Cobourg Peninsula to the Pellew Group in the Gulf of Carpentaria, and to the north-west coast about Cape Londonderry; leaving the whole of the

eastern shore of the Gulf of Carpentaria, and the northwest coast from Port Essington to Cambridge Gulf perfectly untouched. Indeed their visits to the northwest coast, which is known to them by the name of Kai Jawa, are very irregular, as they only venture across the sea that separates it from Timor when the monsoon is particularly mild; and even with this precaution so many accidents occur from the "Hurricane Squalls", which are peculiarly formidable to vessels of the description used by the fishers, that the enterprise would scarcely be persisted in were it not that the trepang obtained there is one third more valuable than that brought from the north coast, which is known in commerce as "Trepang Marigi." The average price of the latter in China, when in a good state of preservation, is seventy dollars the picul, or about half a crown a pound; but there is a kind called "Trepang Passir" which is often sold for a hundred and twenty dollars the picul. Its superiority seems to be chiefly owing to the care and attention bestowed on the curing.

The natives of the Arru Islands, where trepang abounds, are exceedingly skilful in curing it, and with a little management their services might be obtained for periods of a few months at a time. Their mode of curing differs slightly from that of the people of Celebes, the leaves of the Papaya, the macerating properties of which have already been noticed at page 133, being used instead of mangrove bark in the boiling process to assist in removing the outer cuticle, and the trepang is buried in the earth for 12 hours before it is spread out to dry, smoking being only resorted to when the weather is unfavourable for drying in the sun. The fishery is prosecuted so actively at this group that the quantity of trepang collected exceeds that obtained by the fishers on the north coast of Australia, where the animal appears to be far more abundant. Nor are the natives of the Arru group exclusively employed in collecting trepang during the fishing season, which lasts from 6 to 8 months, as much tortoiseshell is exported, and at least half of the cargoes carried off by the trading vessels which visit the group consists of the large mother-pearl shell, which is scarcely less valuable than trepang. The Arru Islands lie on the outer verge of the great bank of soundings which joins New Guinea to Australia, and extends from the northwest coast of the latter to within a few miles of Timor: and the marine productions of the group afford a fair, but by no means favourable sample of those of the entire bank.

With reference to the question of labour, colonists engaged in the breeding of horses, cattle, and sheep will have to obtain their

stockmen from the settled districts in the south, as no natives of the East can ever be brought to equal them in, at least, the more important branches of their duties, such as training horses, and driving in and marking cattle. Higher wages will have to be given than in the south, but this will secure first class men, among whom there is a strong spirit of enterprise and adventure. I know of only one people with a taste for emigration who are calculated to afford the colonist material aid in the minor departments, and these are the natives of the Madras Coast, who would be found exceedingly useful in shepherding, shearing, tailing cattle, bullock-cart driving, and even in training horses, if well looked after by European overseers. Chinese and Malays, as a race, are not well adapted for this kind of work from a deficiency of bodily activity. In the Straits Settlements, the Klings, as the natives of the Madras Coast are generally called, have almost a monopoly of all employments connected with horses and cattle, and as syces, or carriage drivers, they can run beside the horse for long stages without showing symptoms of fatigue.

Klings are also better suited than any other people for looking after coconut plantations, indeed for all kinds of field labour under European superintendence, as they get on better with Europeans than any other native people, perhaps from their having lived for several generations under British rule. And if camels are introduced on the establishment, their services will be indispensable, as Europeans are not at all adapted for taking charge of these animals, although there is no reason why they should not become so. Under these circumstances I consider the services of natives of the Madras Coast are likely to be more in request among colonists, whether engaged in stock-breeding or in agriculture, than any other description of native labourer; more especially as Madras is one of the best markets for Australian-bred horses, so that the labourers could be brought down by vessels on the return voyage at a comparatively small expense.

The Straits Settlements have been the favourite resort of Kling emigrants from the earliest period of their establishment, Ceylon, although so close at hand, being an inferior field in their estimation. They arrive in the Straits in August and September in native vessels, queer-looking brigs and barks, mostly from ports south of Madras, as Cuddalore, Carrical, Nagore, and Negapatam, the southwest monsoon which prevails at this season carrying them across in six or seven days to Pinang, which is always the first port of call in the Straits. The emigrants are all deck passengers, and formerly these vessels were so overcrowded that

government found it necessary to pass an Act restricting the number to one passenger for every ton measurement, quite enough, one would suppose. In some cases the emigrants pay their own passage money, from eight to ten rupees, these being for the most part emigrants returning to the Straits after a visit to their friends at home; but the great bulk are very poor people who have been starved out at home, and are brought by the owners of the vessel on speculation. The greater number of these are engaged by proprietors of sugar and coconut plantations in Province Wellesley, who advance to the owners of the vessel the cost of passage and maintenance during the voyage, on the emigrants entering into an agreement to serve the proprietor two or three years at rates varying from 9 to 13 cents of a dollar per diem, (the average being three dollars a month), until their term is expired. The remainder are carried on to Malacca and Singapore, and are disposed of in the same manner. Some few of the emigrants bring their wives and children with them, but the greater number are single men. Comparatively few seem to have been field labourers in their own country, as it is generally some time before they become accustomed to the work they are put to. During the last few years at least a third of the emigrants have been weavers, this branch of industry being apparently on the decline in their own country. The hired labourers purchase their own food, but are generally supplied with rice by the planter at a price below prime cost.

This system, however, will not be applicable to Australia, where selection will be necessary, and the engagements will have to be made previous to the embarkation of the emigrants from the Madras coast. The colonist requiring labour from this source will therefore have to instruct an agent, say the commander of a vessel about to sail for Madras with horses, and to return direct, as to the number and qualifications of the labourers required. The number ought not to be less than ten, as an overseer who can speak a little English will be required for every party;—and as a cook, a table servant, and a gardener, would be useful on every establishment, besides herdsmen, horse-keepers, and shepherds, there would be no difficulty in finding employment for this number or even more. It is impossible to calculate exactly what the cost of such an establishment might be, as the passage money from the Madras coast would be an important item, but the scale of pay and allowance I give below would, I think, tempt first class labourers to enter into an engagement for three years, and possibly for a longer term; namely for the native Overseer

and Interpreter from 8 to 10 dollars per month, besides which, he will make something by the sale of condiments used in the concoction of curries by his subordinates, and a small advance might be made to him before leaving Madras to enable him to purchase a supply. Six dollars a month, with a weekly ration of ten pounds of rice, and two pounds of salt fish, would be sufficient for the others, at least this, I believe, will be the standard of wages when the place becomes known, although more may have to be given in the first instance. The colonist will also have to engage to provide a passage home for the emigrants at the expiration of their term. By this time, however, good hands will have become so useful to their employers that they will be disposed to offer them an increase of pay, which will be nearly certain to tempt them to stay if they have been treated well. Some of the men should be allowed to bring their wives, free of charge, in the proportion of one to five. It is the custom of these people to form themselves into messes at the houses of the married men, the wives cooking, and receiving a small fee for the service.

The subject of cooly immigration is of so much importance in connection with the settlement of Tropical Australia, that I propose giving a few statistics of its progress at the Mauritius, where, for many years past, Indian labourers, chiefly from the Madras coast, have been the only cultivators of the soil. Some very elaborate returns extending over a period of nineteen years, namely from the commencement of 1843 to the end of 1861, have lately been published by the government of the Mauritius, from which it appears that at the end of the year 1842 there were about 19,000 Indian coolies in the island, namely 18,105 males and 888 females. At the end of 1861 their numbers were 158,922 males; 65,928 females; total 224,850, about 52,000 of whom had been born on the island. The adult male population at the latter period will have been about 133,000, who were employed as under:—

84,380	Labourers on Sugar Estates.
4,351	Gardeners.
1,989	Shop keepers.
1,885	Carters and Carriage drivers.
1,451	Hawkers.
441	Masons.
378	Jewellers.
277	Saddle and Harness Makers.
125	Pastry cooks.

Total...95,277

This leaves nearly 38,00 adult males unaccounted for, who may have become cultivators of their own land, or have had some occupation not defined.

The following table will show that the increase of production at the Mauritius has been proportioned to the increase of the labouring population.

Year.	Production of Sugar.
1843...	55,000,000 lbs. val. £ 796,000.
1862...	261,000,000 lbs. val. £ 2,810,000.

In the island of Ceylon, the immigration of Indian coolies is about two thirds greater than that of the Mauritius. They come overland to the part of the coast opposite Ceylon, and are transported across the Strait of Manaar in native vessels, which, I think, are furnished by the government of the island. Ceylon, although so near, is not a favourite immigration field, as the climate of Candian Hills, where the Indian coolies are chiefly employed, carries off about 20 per cent. of their number. The debilitated state from fatigue and partial famine in which they generally arrive, renders them peculiarly susceptible to the effect of the cold, damp winds of the hills. The following abstract shows the amount of immigration for the Quarter ending with June last.

Abstract Statement of the Arrivals and Departures, from the Continent of India, of persons of the Laboring Class, in the Ports of the Northern Province, for the Quarter ended June, 1862.

	Arrivals.			Departures.		
	Men.	Women.	Children.	Men.	Women.	Children.
Manaar	16,038	4,216	651	2,700	547	73
Tallamanaanar	497	83	16	171	38	6
Total..	16,535	4,299*	677	2,871	585	79

* More than one to every 4 men.

JAFFNA Cutcherry,
22nd July, 1862.

P. A. DYKE,
Government Agent.

Whether any great demand will arise for Chinese agricultural labourers remains to be seen, but if tropical produce comes to be cultivated on a large scale, India alone could not supply the number required, and Chinese labour will be best suited to supply the deficiency. In that case it may be expected that the immigration will be carried on much in the same manner with that to the Straits Settlements, the immigrants being brought down as a deck freight, and residents in the settlement advancing the amount of passage money on their engaging to serve for a term. Their cost will be somewhat less than that of Indian labourers in the matter of passage money, but they must not be expected to serve after their term has expired, as they will probably commence working on their own account, either as cultivators or as petty tradesmen.

There can be no doubt whatever that a large spontaneous immigration of Chinese will set in on the Tropical Coast of Australia as soon as the country has become sufficiently occupied by Europeans to afford them protection from the natives; as the marine productions are so abundant and of so valuable a description that they would long ago have been active in the enterprise but for the dread they entertain of the wild black tribes of the Archipelago. As it is, they are the chief, if not the sole supporters of the trepang and tortoise shell fishery carried on by the natives of Celebes and Sumbawa, who would be unable to fit out their expeditions were it not for the advances made by the Chinese merchants and traders of Macassar. No encouragement will be required on the part of Europeans, as they are now so well supplied with information as to what is going on in Australia, that they will enter the field the moment it is fully opened by the establishment of permanent settlements on the coast. Their enterprise is likely, in the first instance, to be directed towards the marine productions; and salt fish, edible seaweed, pearls, mother o'pearl shell, kima shells, shark's fins, *balachong* or caviare made of fermented shrimps, and many other productions suited for the China market, will be added to those which they have heretofore procured from the coast through the instrumentality of the Indian Islanders. Although the Chinese are year by year becoming more partial to the use of vessels of European construction, I think that the collection of these products will be carried on in Junks such as those employed on the coasts of China, as they could make the voyage with safety as regards seaworthiness, and their construction and fittings are peculiarly suited for the work in which they would be engaged.

There are also many articles produced on the land with which Chinese speculators will interest themselves, such as Mangrove bark, dye woods, and hard-wood timber for junk's anchors, all of which are suited for the Chinese markets; and it can scarcely be doubted that the admirable commercial skill which they have displayed in the Straits Settlements and California will soon place them in the front rank of the trading community. The settlement of this people in the Tropical Region is not likely to be viewed with the same jealousy that has been displayed towards them in the South, where men of education, actuated by patriotic feelings, and anxious to maintain the purity of the British race in the country of their adoption, have combined with the labouring classes, whose jealousy is naturally aroused by the irruption of a people equally industrious and more frugal than themselves, to oppose their admission. And it must be confessed that there is nothing in the manners or character of the Chinese people, especially of the class that would be attracted by a gold producing country, calculated to invite fraternization in the part of an European race. It is indeed only among those who have become intimately acquainted with their industrious habits, the many good points in the character of the middle classes, and the facility with which they are governed when the right course is adopted, that any feeling of respect can be entertained towards them as a people. Nevertheless it seems inevitable that sooner or later the coasts at least of the tropical region will come to be occupied by them in great numbers, and the only course to be adopted under the circumstances is to turn them to the best account. No alarm need be felt lest they should ever attain political supremacy, as they are incapable of self government, and the control of a superior race will be necessary to their prosperity and even to their very existence.

All the Indian Islands, excepting, perhaps, those under the immediate control of the Dutch, will furnish labourers in inexhaustible numbers as soon as profitable employment is offered to them in branches of industry for which they are best suited, such as fisheries, and the preparation of timber for export or domestic consumption. For such employment as the above, the natives of the Indian Archipelago, even the least civilized, would be found well adapted, as they are all practiced woodmen, and well accustomed to handle edge tools. I will therefore proceed to give some details respecting the islands capable of furnishing labourers, commencing with Rotti, the nearest to the continent of Australia, being only 260 miles distant from Cape Bougainville. This

island contains about 20,000 inhabitants, the greater portion, if not the whole, being Christians of the Dutch Reformed Church; Rotti having been the chief field in which the members of the Mission established at Kopang have exerted themselves. The entire population is engaged in agriculture during the rainy season, maize, yams, and bananas, being the chief articles produced; but the supply raised is very rarely sufficient for their consumption, and many of the men migrate to Kopang, as soon as their crops are in the ground, to seek employment as labourers, returning to their homes in time to take part in the labours of the field when the rainy season returns. They are a quiet, industrious people, and I have personally ascertained that many of them would willingly accept employment in Australia during the eight months in which their labours at home are suspended, if a passage each way is provided for them, and their return home in time to put in the crops is ensured. As the labours of the fisheries and forests in Tropical Australia will have to be suspended during the rainy season, this arrangement might suit both parties, and I do not think that the Dutch Government would object, although it would certainly interfere in regulating the temporary migration, and would probably also impose a tax on the emigrants. Savu, and some of the islands north of Kopang might also furnish their quota of temporary labourers, but I do not think that Timor itself will contribute, although the population must be nearly quarter of a million, for the slave trade is almost as rife here as in the interior of Africa, and where man-hunting is a common pursuit, honest labour is at a discount; and this is the case in Timor. But the Serwatty Islands and Timor Laut, which are occupied by a people closely resembling the natives of Rotti, and many of whom are also Christians, could supply some hundred of temporary labourers if it were made worth their while. A number of emigrants from Timor Laut is always to be found at Banda, where there is no native labouring population, and they are literally the hewers of wood and drawers of water, performing all the more laborious domestic duties. They come in their own prahus, and generally remain two or three years, their home ties appearing to be less strong than those of the natives of Rotti and the Serwatty islands.

Bali and Lombok could supply several hundreds of stout labourers without their being missed at home, but great caution will be required here, as slavery is in full force on these islands as well as in Timor, besides a system by which debtors remain in bondage to their creditors until their debts are paid; and the chiefs

might force them to enter into contracts without their free consent.

Java, and the small but populous island of Bawian or Lubeck furnish some hundred of labourers, to the Straits Settlements, but these arrive under peculiar circumstances, being Mahomedan pilgrims on their way to Mecca, who remain in the Straits until they have amassed sufficient money to pay their passage on to Mecca; or returned pilgrims who remain until they have worked out the cost of their passage back by the pilgrim ships, which are chiefly owed by Mahomedan merchants settled in the Straits, generally Arabs, or of Arabian descent. Such a class of labourers would not, however, be desirable for Australia, as the returned pilgrims especially are very bigotted, and the instruction they receive from the holy men at Mecca is not calculated to improve their feeling towards Europeans.

Details respecting the best markets for horses and live stock have already been given in Part I. London will be the best market for other descriptions of pastoral produce, as wool, tallow, hides, and horns, and for the first few years it is unlikely that there will be opportunities for shipping direct home, as the quantity of produce will not be sufficient to furnish full cargoes for large vessels. This difficulty, however, will soon disappear, and in the meantime produce intended for the home markets can be forwarded to the Mauritius or other ports where ships load for England, by vessels carrying live stock, which can always find room for a few tons of cargo in their fore and after peaks. Or it may be sent on by ships bound through Torres Straits to seek homeward cargoes in the ports of India. Nearly a hundred seeking ships pass through the Straits every season, and some at least may be expected to call at the chief ports of the newly opened districts; but if speedy shipment is a matter of importance, it will be well to send intelligence to Booby Island, which is now the last stopping-place for ships passing through the Strait.

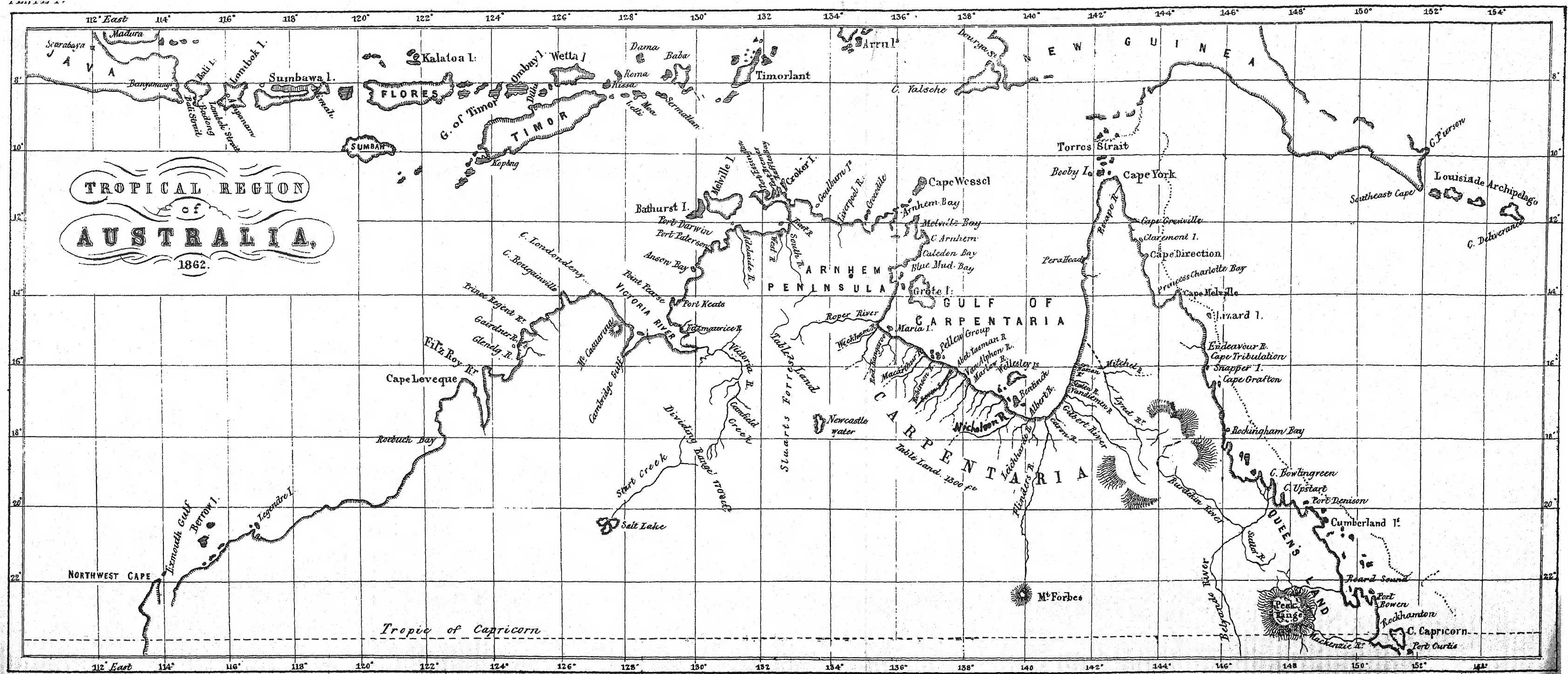
British India has already been mentioned as the best market for hard-wood timber, but there is also a large demand at the Mauritius, and when the Cypress Pine forests come to be invaded, and saw-mills established, the timber trade with this island is likely to become of considerable importance. Freights will be low, as colonial vessels bound to the Mauritius for cargoes of sugar generally sail in ballast, flour from South Australia being the only description of produce regularly exported. This island will also be the best market for salt fish should colonists turn their attention in that direction, as the consumption by the native popu-

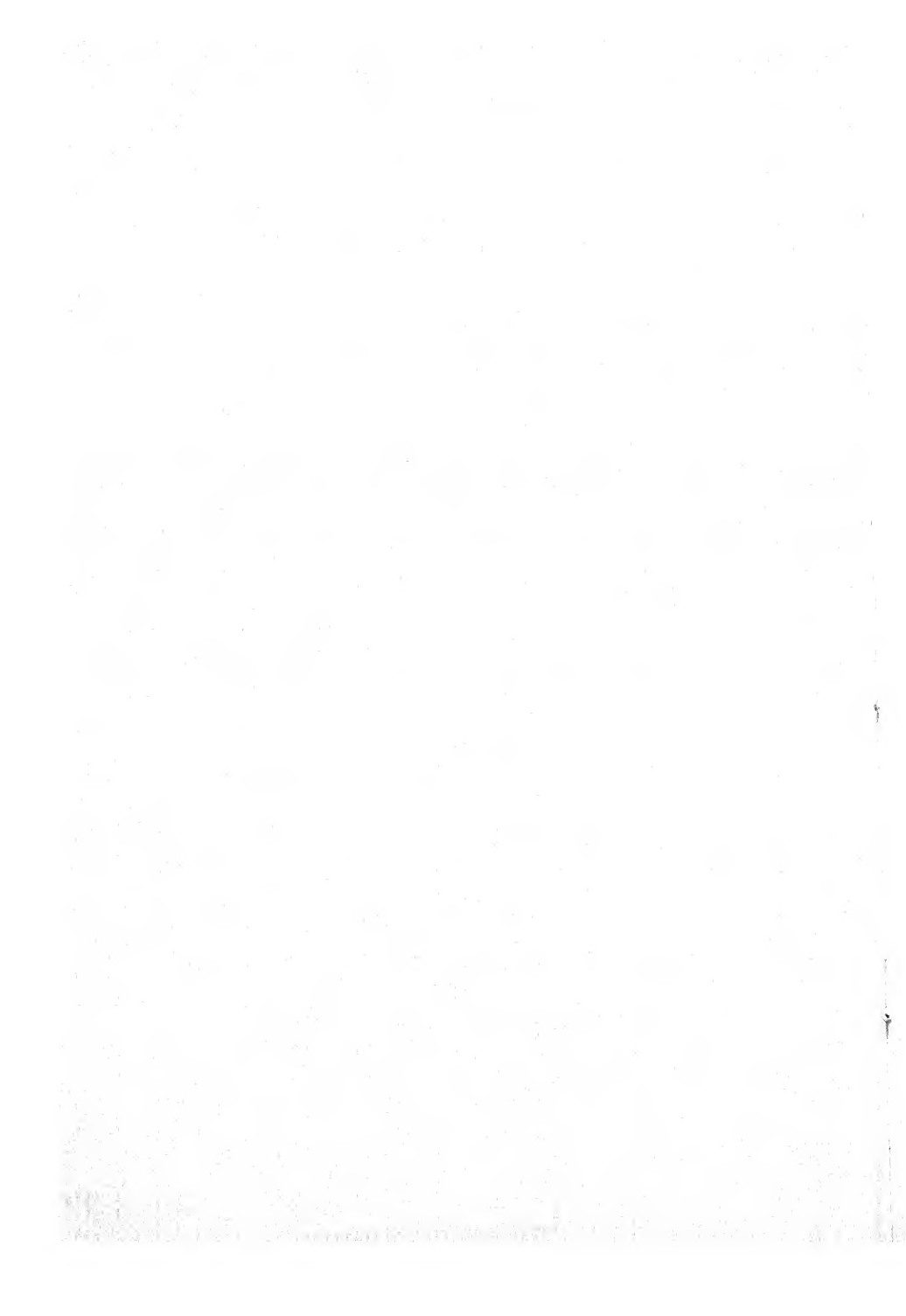
lation is very large, and the island itself has no fisheries of importance.

[Since the above was written, I have received application from parties in the colonies who contemplate trying their fortunes in Carpentaria, for information as to whether the Straits Settlements could furnish them with their annual supplies. There are certain articles which are indispensable on a sheep station, such as wool-shears, drays, materials for sheep-dressing, &c., which cannot be obtained here at present, and it would be best for parties before starting on their enterprise, to make arrangements with a merchant at one of the Southern ports for sending on their annual supplies by some vessel bound through Torres Strait, which could take on their wool to a port at which it could be shipped for Europe. If the party is sufficiently large to bear the expense of a small vessel of 40 to 60 tons burthen, it would be a great acquisition from the very first, as there must necessarily be a quantity of useful articles belonging to the party that cannot conveniently be transported overland. After discharging her cargo at some port or river in the Gulf where she would meet the party, the vessel might be usefully employed in keeping up an intercourse with the Islands, where many articles are procurable that would be extremely useful, if not necessary, to a new establishment. It would, of course, be convenient if some article were immediately available to furnish an export cargo, but I know of none with the exception of salt, large deposits of which are found in some of the salt water creeks of the Gulf. Leichhardt's party came upon one of these immediately after making the Gulf. I think I have already extracted the paragraph of his journal which records this event, but to make sure, I will insert the details here "I started immediately with Mr. Calvert and Brown, and sure enough I found the broad bed of a creek one mass of the purest and whitest salt. Lumps of it had crystalized round stems of grasses which the wind had blown into the water. A little higher up the creek, a large pool of water was full of these lumps, and in less than ten minutes we collected more than sufficient to supply us for the rest of our journey. Ship loads of pure salt could have been collected here in a very short time, requiring nothing but drying and housing until it could be removed." (*Journal* p. 346). The locality is not distinctly indicated, but it must have been near the mouth of the Gilbert or of the Caron river. Salt, however, is a strict government monopoly at the Dutch ports of the Archipelago, where the supply is furnished from the government salt pans of Madura, near Java; but there are still some native

ports, as Ampanam on the island of Lombok, and Badong in Bali, where it can be imported without risking the seizure of the vessel. In the course of time other articles suitable for the consumption of the islands will be available, as already noticed.

The naval station recently formed at Port Albany, near Cape York, will indirectly facilitate the movements of colonists from the Gulf of Carpentaria westward, as it will give an impulse to the Tre pang fishery in that neighbourhood, the produce of which must be taken on to Singapore, and the vessels so employed are likely to call at the ports of the north and northwest coasts as they become occupied, for the chance of freights either way. The well-known Sydney firm that has been engaged for some years past in the Tre pang fishery on the northeast coast, might be induced to co-operate with parties proceeding to the Gulf of Carpentaria, and such an arrangement would probably be more satisfactory than if each party possessed a small vessel for its own exclusive use.]





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